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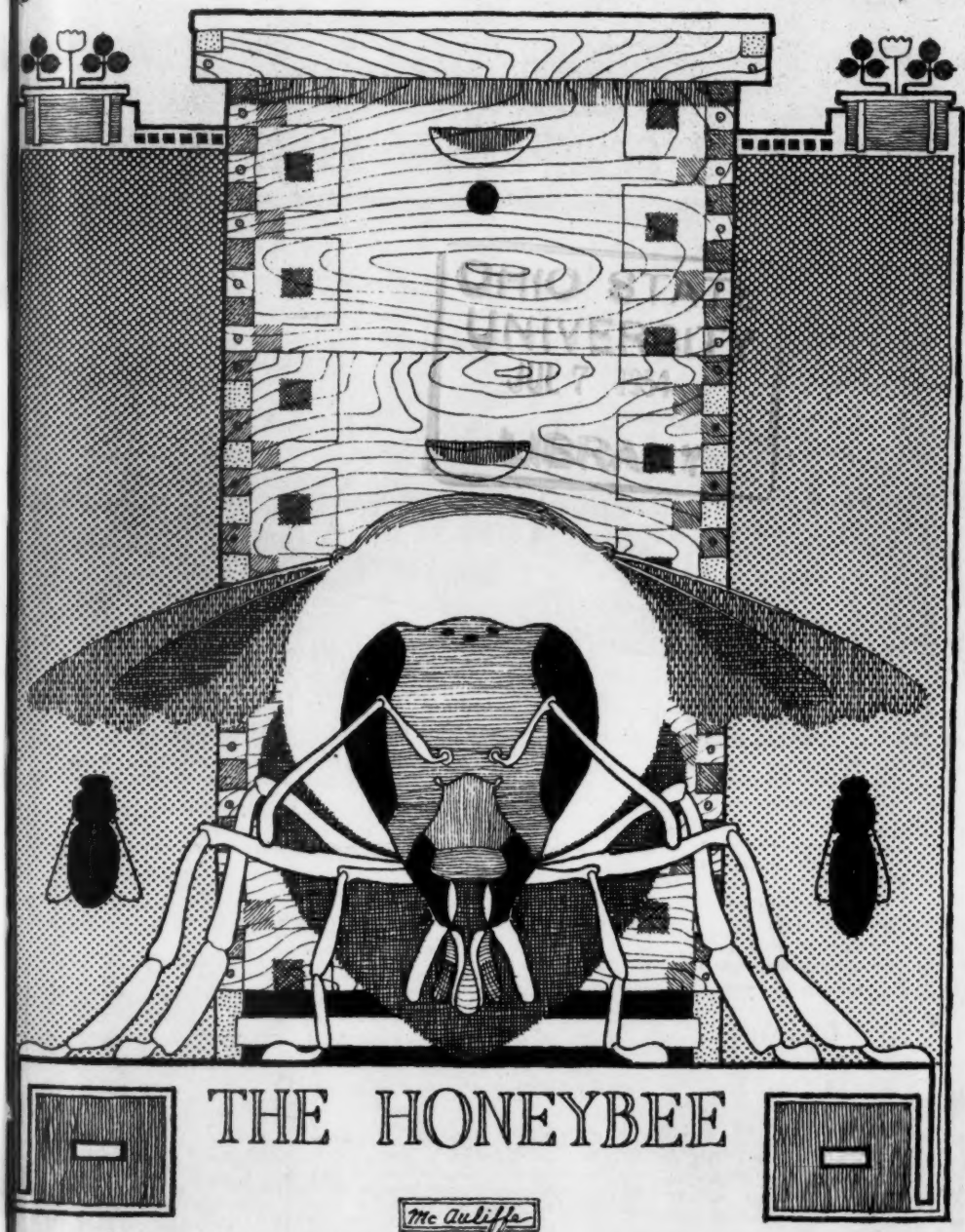

THE HONEYBEE

Mc Auliffe

Gleanings in Bee Culture

July 1954

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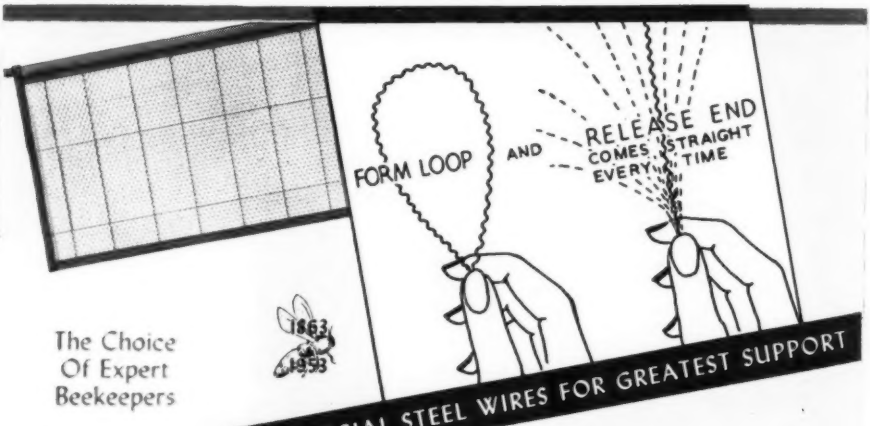
DADANT'S CRIMP-WIRED FOUNDATION



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- Refined for utmost cleanliness
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- Every sheet the same
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Gleanings in Bee Culture

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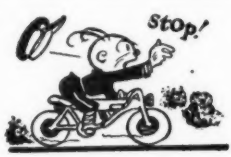

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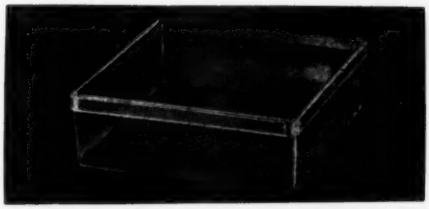

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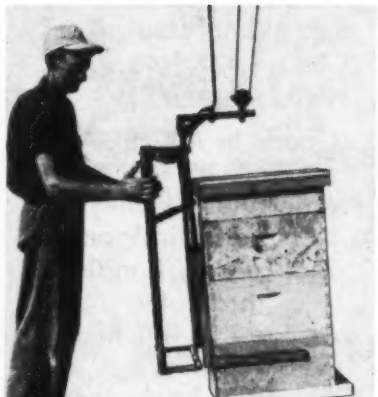

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Monthly HONEY Report

United States Market

The following figures represent an expression of current prices from beekeepers and honey packers over the country. They are based on several reports from each state averaged with the reports in the region. Where insufficient information is returned, prices have been omitted from the chart. Where three figures appear on the chart the first figure represents the low, the middle figure represents the average, and the third figure the high price in cents per pound. Where only two figures are used the low and high are shown.

	North & South Atlantic	South Central	North Central	Midwest	West
Bulk Honey:					
Table Grade	11-12½-15c	12 18c	12-12½-18c	11-12-13½c	12c
Baking Grade	10 16	12	10-11-16	10 12	9-9½-10
Price to Grocers:					
5-lb. jar - can	17-20-23½	19-22-25	17-20-26	19 25	16-18-20
2-lb. jar - 12's		25-27½-30	23-24-25	24-25-26	21-22-25
1-lb. jar - 24's	23-25-30	27-29-30	23-25-27	25 27	22-23-26
Comb Honey:					
Cs. of 24 Sec.	$9-9.60	$9	$7.20		
Retail Price:					
60-lb. can	15-16-20	21 25	16-18-22½	16-17-19	16-17-19
5-lb. jar	20-25-35	29 30	20-23-25	20-22-32	20-23-26
2-lb. jar	32½-37-42	32-35-42½	26-28-32½	23-32-35	23-29-35
1-lb. jar	29-35-45	35 39	28-30-33	28-31-35	30-32-35
Crop Outlook:	Good	Fair	Fair	Fair to Good	Fair
Conditions of Honey Plants	Good	Fair	Fair to Good	Good	Fair to Good

"Royal jelly attracting attention. One small importation at $110 per pound".—S. E. Ariz.
"Series of freezes in past two weeks will curtail crop".—Colorado.
"Bees strong. Plenty of moisture and heavy bloom".—Oregon.
"Colonies strong but plants are backward".—S. E. Minn.
"Cool may set colonies back considerably".—Alabama.
"May freeze damaged sourwood in some areas".—Tenn.
"Some honey from crimson clover".—Delaware
"Best flow in years".—Pa.
"Getting about half a crop".—Arkansas.
"Possibility of getting biggest honey crop since 1941".—Ohio.

Canadian Market

(Unless otherwise specified, all quotations are for cases of No. 1 White.)

HALIFAX: Mkt. steady.
N. B., Ont., past paper,
24/2's $12.50
24/1's 6.50
SAINT JOHN: Mkt. steady.
Ont., past., glass,
24/16-oz ..... $ 7.25
paper,
24/1's 6.10
24/2's 11.10
MONTREAL: Mkt. firm.
Que., White, metal,
24/2's $10.75-11.50
12/4s 10.50-11.00
glass,
24/8-oz. 4.25- 4.50
24/16-oz. 6.25- 6.75
Dark, metal,
24/2's 6.50- 6.75
OTTAWA: Mkt.. steady.
Ont., past., paper,
24/1's ..... $ 5.75- 5.80
metal,
24/2's 10.75-11.55
12/4's 10.50-11.65
Golden,
12/4's 8.10- 8.50
Amber,
12/4's 8.50- 9.75
12/4's 11.75
TORONTO: Mkt. steady.
Ont., past., paper,
24/2's $10.25-11.00
24/1's 5.45- 5.75
glass,
24/16-oz. 6.25- 6.50
Amber, paper,
24/2's 7.00- 7.50
Dark, metal,
24/2's 7.00- 7.50
WINNIPEG: Mkt. steady.
Man., metal,
24/2's ..... $ 9.80
12/4's 9.30
past., paper,
48/1's 11.35
24/2's 10.50
REGINA: Mkt. steady-firm.
Sask., metal,
12/4's ..... $ 9.85-10.00
past., paper,
48/1's 11.55-12.00
metal,
24/2's 11.20-11.35
12/4's 11.00-11:05
6/8's 10.85-10.95
SASKATOON: Mkt. steady.
Sask., metal,
24/2's $10.15-10.25
12/4's 9.50- 9.75
past., paper,
48/1's 11.40-11.50
metal,
24/2's 11.20-11.30
12/4's 10.85-11.00
EDMONTON: Mkt. steady.
Alta., metal,
12/4's ..... $ 9.00- 9.60
past., paper,
48/1's 10.85-11.30
metal,
24/2's 9.52-11.00
liquid, glass,
12/12-oz. 2.93- 3.35
B. C., liquid, glass,
12/1's 4.45- 4.85
CALGARY: Mkt. steady.
Alta., metal,
12/4's $10.40
6/8's 10.40
past., paper,
48/1's 11.00-11.25
24/2's 10.50-10.75
metal,
12/4's 10.45
VANCOUVER: Mkt. slightly stronger.
Alta., past., carton,
48/1's $12.00
24/2's 11.60
metal
24/2's 12.00
12/4s 11.60
liquid, past., glass,
12/12-oz. 4.60

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100-499	.65	2.70	3.50	4.30	5.10

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Medina, Ohio

Transferring bees to movable-frame hives

by A. C. GOULD, Apiculturist, N. Y. Dept. of Agriculture, Albany

The bees on the stand have just been transferred from the old-fashioned gums on the D. W. Crosby Farm.—Photo from L. W. Alford.

BEES IN BOX HIVES or in modern hives with combs built crosswise are of little value as it is impossible to manipulate the frames and they may harbor disease and spread it throughout the entire neighborhood.

The easiest way of transferring bees is what is known as the drumming method. First, secure a new modern hive, the frames of which are filled with full sheets of foundation. A small box should also be secured with an opening about the size of the bottom of the box hive, into which the bees are to be drummed.

On a warm day when many of the bees are out gathering nectar, a little smoke should be blown into the entrance of the box hive to induce the bees to fill themselves with honey. The box hive should now be removed a short distance. The new hive, preferably with at least one drawn comb in it, or better still, a frame of brood taken from another colony, should now be placed on the old stand to receive the returning bees. A little more smoke should be blown into the entrance, the box hive should be inverted and the bottom removed, if there is one. The empty box is now placed over the inverted hive. A piece of burlap may be used to cover any open space between the hive and the box. It is important that the bees should have a clear runway up the side of the box hive between the combs and into the empty box, although the box need not fit closely at other points.

Now rap on the sides of the box hive with a stick or stone hard enough to jar the combs. The strokes should be regular and continuous. After a few raps the bees will begin to run upward and the drumming should be continued for perhaps ten or fifteen minutes, until three-fourths or more of the bees and queen have entered the box on top. These bees may then be thrown in front of the new hive as in hiving a swarm. If the queen is not seen as the bees pass into the hive, it

will be well to drum more bees from the box hive.

If the old hive has a removable cover and is of approximately the same size as the new hive, the new hive may be placed on top of the old one and the bees drummed into this making it unnecessary to drum the bees into the box as described above.

The old box hive may be placed in a new location for two weeks and then the bees which have hatched can be driven out and added to those in the new hive which were previously drummed out. In order to prevent fighting, the new hive should be well smoked before adding the second lot of bees.

If disease is present in your locality you should never use brood or drawn comb in the new hive. It is best to use only foundation and drum all the bees possible out of the old hive at the first drive and then dig a hole, burn, and bury the old box hive with its contents.

THERE IS another method which can be used to advantage and involves but little labor. Remove the top of the old hive and place the new hive filled with full sheets of foundation on top. Make the joints between the old and new hive as bee-tight as possible, leaving only a small opening in front for an entrance. The entrance at the bottom of the old hive should be closed so that the bees will have to enter at the opening between the two hives. It will help if a few old combs or a frame of brood can be placed in the new hive.

After the bees have started working up into the new hive and as the queen goes up, a queen excluder can be slipped between the old hive and the new one and the old hive left until the brood has hatched, or the bees can be smoked and drummed into it as described above, and the old hive removed.

This method, in order to be successful, must be used on strong colonies only, and before the main honey flow is over. **This technique should not be used if American foulbrood is present in the apiary.**

The best time to transfer bees is just before or during the early part of the honey flow.

More detailed instructions for transferring can be obtained by writing to the U. S. Department of Agriculture, Bureau of Entomology, Bee Culture, Washington, D. C., asking for Farmers Bulletin, No. 961, "Transferring Bees to Modern Hives".

Caution: If AFB is present in your locality, the only safe method is to drum out all the bees described above and shake them into a new hive with full sheets of foundation or starters in the frames. Empty combs must not be placed in this new hive. The old box hive should be destroyed as soon as the bees are drummed out.

Simplifying Apiary Management

by L. G. LESTER, Roanoke, Virginia

SINCE MY HOME is in town, I keep Caucasian bees because of their gentleness, and while I have only a small apiary, I have never had a complaint. In fact, so far as I know none of my neighbors have been stung.

During the honey flow I take most of my bees to good locations out in the country and then bring them back to town later so they will be handy for checking and feeding.

I made a device to weigh the back end of a hive, without effort, so as to estimate closely what the whole hive weighs, enabling me to determine how much to feed. As I get experience everything becomes simpler and easier.

Feeding is a good example of this idea. For instance, when I made syrup this fall I made 150 pounds at a time in a washing machine. Next year, however, I plan to leave on the food chamber to avoid the necessity of feeding and also to leave most of the bees in the country and avoid handling them in and out.

[A well-filled deep super of honey—commonly called a food chamber—left on each colony helps to insure successful wintering and populous colonies in the spring and for major honey flows.—Ed.]

Honey houses in the Finger Lakes region

by ROGER A. MORSE, Ithaca, N. Y.

Large commercial beekeepers have adopted the automatic uncapping machine.

HANDLING 25 or more tons of honey a year requires the best in equipment and methods. In order to determine what methods are being used, four commercial beekeepers, who handle this much or more honey per year, in the Finger Lakes region were visited and their methods studied.

When the honey is brought to the honey house three of the four beekeepers use an unloading dock which is the same height as the truck bed. One of these beekeepers has a shed built over the truck so that robber bees will not be a problem. This shed also serves as a garage for the truck. Bag trucks which have been described many times in the bee journals (see Hive Lifts, Dec. 1953 Gleanings) and are sold by some concerns are used by all these men and make it possible for a load of three or four tons of honey to be unloaded in a matter of a few minutes.

In two cases the honey is moved directly into hot rooms where the temperature is maintained at 85 to 90 degrees F. In the other cases the extracting room is kept warm by means of a space heater. This of course makes the working conditions warmer than desirable. The supers are kept on pallets and in some cases they may be staggered on the pallets to allow a better circulation of air and warming of the honey. In the Finger Lakes region there is little trouble with high moisture content honey and no special precautions are taken to remove moisture from the honey in the hot room.

The supers are moved, a pallet load at a time, to the uncapper. All four of these beekeepers use an uncapping machine of the Bogenschutz type. Since this machine was originally constructed in this area many of its predecessors are to be found locally. One of these men is using the new machine, however. Two of them are using two large radial extractors and two are using three radials. If the uncapping machines were run at full capacity more extractors would be necessary. One beekeeper places 90 frames in a

Extractors should be placed close to the uncapping machine.

50-frame extractor and finds that it works most satisfactorily.

Before the frames are placed in the uncapper the bottom bar is scraped clean by moving it across a knife edge. The top bars are cleaned after the frames have passed through the uncapper with a wide putty knife. The frames move on an endless chain and the uncappers will hold about 50 frames.

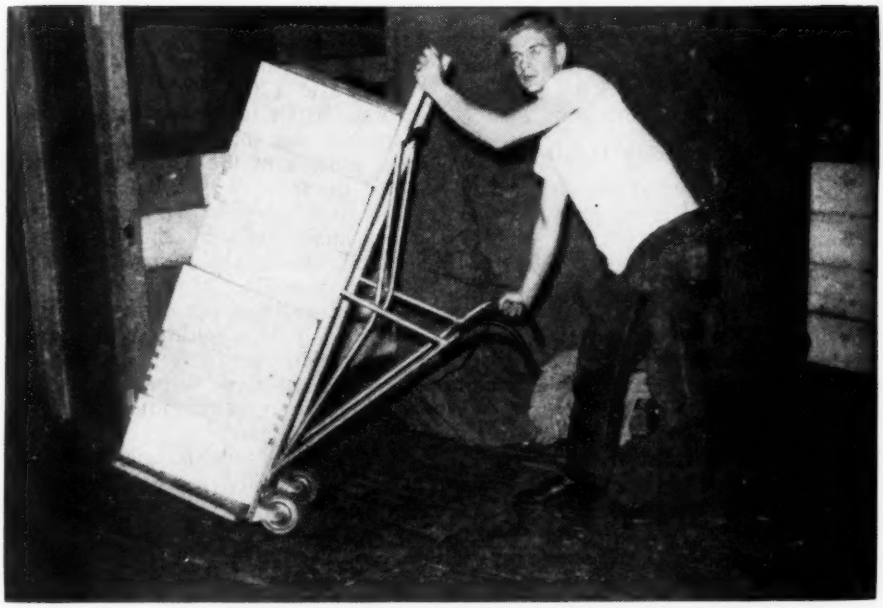
In some cases the extractors are driven by individual motors and in one case a flexible shaft connects the extractors so that only one motor is necessary.

Cappings are handled in different ways. One man allows all the cappings and honey from the uncapping machine to run with the honey from the extractors into perforated baskets on the floor below the extractor. Here they drain. When one basket is full of cappings a second basket is put into place and the first is whirled dry in a large laundry type whirl-dry. After the cappings are dried they are placed in drums to be rendered in the winter. The room where the cappings drain and are dried is heated so as to facilitate handling the honey.

The other men keep the wax and honey from the uncapper separate from that which comes from the extractor and either shovel the cappings out of the uncapper or from the top of a settling tank. In the first case the uncapper acts as a baffle tank. One beekeeper allows the bees to work over the partially drained cappings. For this purpose and also to dry combs in the fall a special yard is maintained a few miles from the honey house. No trouble with disease which can be attributed to this cleaning of the cappings or combs has been noticed and this method has been used for a number of years.

Baffle tanks to separate the rest of the cappings from the honey are next in line. In two cases the honey is heated before it flows into the baffle tanks. In one case it is run through a pipe with a hot water jacket around it. In another case the honey flows over a heating trough. Two of the men use baffle tanks in which the honey is 18 inches deep. A large surface area and a shallow baffle tank allow better settling of the honey and give a clearer product.

Another beekeeper uses two baffle tanks each of which hold about a ton of honey. The surfaces of these tanks

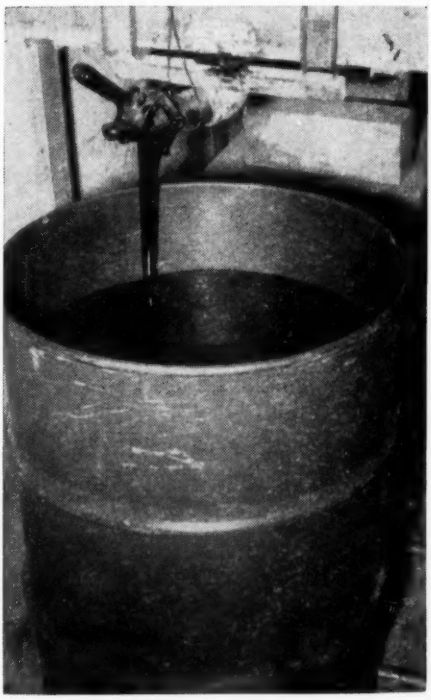


A labor-saving bag truck in operation by Herbert Pallesen.

are skimmed with a large shovel. In one case the honey is then passed through an O. A. C. strainer which gives it a final cleaning.

These beekeepers wholesale a large portion of their honey. One packs some for the retail trade. In the latter case the honey is reheated by a flash pasteurizer and strained before it is packed. The other beekeepers ship their honey in drums or 60-pound cans. Drums are becoming very popular in this region. Bag-type trucks are on the market for handling these drums which hold about 600 pounds and in other cases they are handled with chain hoists. The Finger Lakes Honey Producers' Cooperative can unload drums in a fraction of the time it takes to unload cans. Their pallet truck is equipped to pick up the drums and carry them to any part of the plant.

Drums are also preferred because they cost about the same as cans per unit of weight. The type of 60-pound can made today is not as sturdy as the old can. After one trip it is usually rusted either on the inside or out. A drum, on the other hand, will stand many trips to the market. The



Many New York beekeepers are now shipping honey in big drums as shown above.

most popular drum is the one with the whole top removable so it can be easily cleaned. The inside of the drums now in use are coated so as to resist corrosion and this protects the honey.

An Ideal Honey House

The honey houses of these four men are not at all alike. If we were to make a composite of all of them and pick from each the most desirable features the construction would be as follows:

The site is a small hill or incline. The building either of wood or cinder block is two stories. The supers of honey come in on the upper level and the honey ready for market is removed on the lower level. The empty supers are extracted and returned to the truck from the upper level. There are unloading docks, the height of the truck bed, at both levels. The supers of honey are unloaded and transported with a bag truck to a hot room and from the hot room to the extracting room. An uncapping machine with two or three extractors are used and as the honey is extracted it flows into a large but shallow baffle tank. From here it is heated to 120 degrees F. and flows to other baffle tanks and then through a strainer and into a storage tank. A large portion of the cappings are held in the uncapper with a baffle.

Six inches below the height of the honey maintained by the baffle is a screen enclosing the entire area of the uncapping holding tank. At the end of the day the baffle tank is drained and the cappings settle on this screen from which they are removed the following morning. From the storage tank the honey is run into 600-pound drums for shipment.

The honey house is small but large enough to hold at least two days' extracting. The empty supers are stored in the yards or in small buildings so that fire would not cause too great a loss. The honey house is so built that it will serve as a work shop in the winter.

Sir Edmund Hillary Fund

by A. R. CORMACK, England Bee Research Association

A collection of books on bees and beekeeping has been selected by the Council of the Bee Research Association for presentation to Sir Edmund Hillary. We are sending to all who subscribed directly to the Fund a copy of the bookplate (specially designed by Mr. R. D. Simpson) which has been inserted in each of the books. A list of the books may be obtained on application to the Bee Research Association.

As Sir Edmund Hillary will not be in this country for a year or more it is impossible to arrange a personal presentation; the books are therefore being sent to him in New Zealand, together with a check for £25 which represents the balance of the Fund.

It's Spanish needle time

by MILTON H. STRICKER, Annandale, New Jersey

An apiary in the Spanish needle country.

JULY AND AUGUST bring a lot of queer rigs to the roads. You'll see bees piled in hobbyists' cars, on jalopies and trucks, both large and small, being moved to the lower Delaware Valley, to the areas of the Bidens.

And, who wouldn't move? If you knew of a honey plant that has given moderate to great crops each year for over 20 years, wouldn't you? Besides that, it will provide a beautiful sparkling, light yellow honey with A-1 sales appeal.

Though there are many varieties of the Bidens family, to most beekeepers it is all called Spanish Needle. Its small yellow daisy-like flowers begin to bloom about the last week in August and continue until about the second week in September, sometimes longer.

Weak colonies are moved into the area in late July to catch the nectar from the purple loosestrife **(Lythrum salicaria)** which is usually present in the area. Colonies will often build up to take advantage of the Spanish Needle flow, and what once was a weak colony will become a populous, ready-to-be-wintered colony.

The "needle" grows in marshes of tidewater New Jersey, and where it does not get killed out by oil from the well-polluted Delaware, it blooms and yields profusely. Nectar is thick and easily ripened, and bees gather early in the morning, gathering as much as nine pounds per day. Shortly before noon, the nectar usually cuts off, and bees will work other plants, or perhaps work the "needle" just for pollen.

Joke Backfires

A few years ago, a north Jersey beekeeper was visiting a south Jersey beekeeper whose colonies were on location in the "needle". They saw the fabulous intake of a scale colony and, as a joke, sent a telegram to a mutual friend in north Jersey, stating: "Scale colonies gaining 9 pounds a day. Wish you were here."

That night, the first beekeeper arrived home to find the recipient of the telegram waiting for him, and asking him to help him load some bees to be moved into the area. Five hours later, at two o'clock in the morning, the south Jersey beekeeper was awakened by the recipient of the telegram, who wanted a location in the Spanish Needle area and some help unloading the bees. This was a joke that backfired. Besides teaching the two practical jokers better manners, the beekeeper who got excited by Western Union averaged 60 pounds of honey per colony in the last two weeks of the flow.

COLONIES ARE usually operated in three stories, sometimes more, and

sometimes colonies are "bottom supered" to give the queens a place to lay when the brood nest becomes honey bound, as it sometimes does in bumper years.

The plant yields best when the days are hot and dry and the nights are cool. If hot days and nights are both present during the flow, the "take" will be lessened but never quite bad enough to be called a total failure.

Though the plant grows best in moist localities, it will grow in dry areas, and seed is often collected by beekeepers for ornamental plantings around home.

Some years ago in Trenton, New Jersey, sand pumped from the Delaware River inland, about two miles away, contained the seed. The plants still come up each year and though high and dry, it offers some nectar to neighboring bees.

Many Varieties Exist

Beekeepers in the area call the early blooming plants Spanish Needle, but later, as the plants begin blooming in the heavier and wetter soil, it is designated as burr-marigold. Closer examination shows many of the same varieties of plant are blooming at these times. Though **Bidens laevis** is the most common, botanists are loath to commit themselves on the number of varieties, however, there are many, and there are no doubt "sports" that do well on dry land and others that grow with their roots actually in water.

In general, the plant resembles its cousin, **Bidens frondosa,** known by everyone as beggar tick. Spanish Needle, like beggar tick, grows from two to three feet tall, has a smooth brown stem, and usually, the leaves are borne opposite on the stem. Leaflets are usually thin, pointed, and sharply toothed.

The seed is brown, like the beggar tick, but has no barbs to catch clothing, and it is usually thinner. Its flower is yellow and much larger and showier than frondosa. The flowers have eight petals, and because of this, make desirable ornamental plantings, but, if you do plant, don't expect your bees to work them unless the soil is damp and well filled with organic matter. Even then it may not yield nectar in your area.

Beekeepers in other parts of the State of New Jersey are anxiously watching the natural growth of the plant in areas other than the southern part of the State. Even now, there are two areas in the northern part of the State that offer crops to bees where there was no Spanish Needle ten years ago.

No one knows how the seed got into the upper reaches of the Raritan Valley, but its spread is steady and beekeepers are wondering if some day the nectar-giving Bidens family may not take over the edges of every stream and river in Jersey, and it can't come too soon to beekeepers who are in a state where weed killers have played havoc with their honey plants.

Skunking Skunks

by WALTER BARTH, Associate Editor

ARE SKUNKS giving your apiary "B.O."? Like to know how to get rid of the "striped kitty" with his very effective "ammunition", without getting his "B.O."? Here is a way that promises to beat trapping, poisoning, and shooting.

Set a conventional steel trap in the hole frequently used by the skunk. Leave enough chain so that the skunk can pull the trap down into the hole after he is caught. When he is caught and goes down into his hole place a box over the hole in such a manner that the chain can be pulled through a small opening in the back of the box. Thus the skunk is drawn into the box without getting a chance to use his "ammunition" on you.

Once the skunk is in the box close the ends. Where the chain comes through the box pour in two or three tablespoons of Cyanogas. No more skunk.

(P. S. You can reclaim your steel trap, if you want it, after the skunk is no longer able to stir up a stink.)

Paper chromatographic analyses of some southern nectars

by M. E. BAILEY and E. A. FIEGER, Department of Agricultural Chemistry and Biochemistry, Louisiana Agricultural Experimental Station, and E. OERTEL, U. S. Department of Agriculture, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, Baton Rouge, Louisiana.*

LITTLE IS KNOWN about the kind and the amount of sugars contained in the nectar of flowers or the environmental factors which may influence them. The principal reasons for this are the difficulty of obtaining sufficient amounts of nectar for analysis and also the lack of good quantitative methods adapted to such small quantities.

Bonnier (1878) was the first investigator to study extensively the effects of external factors upon nectar secretions. He showed that fluctuations of temperature, relative humidity, rainfall, and soil moisture brought about changes in the sugar concentration of nectar. His work stimulated further investigations of the effects of these external factors and other variables on nectar secretions. See Beutler (1930), Boetius (1948), and Fahn (1949) for the results of more recent studies.

Most early investigations indicated that glucose, fructose, and sucrose were the only sugar constituents in nectar, but Wykes (1952a), who used some of the recently developed chromatographic technics, showed that trace quantities of other sugars were also present in blossoms of various plant species.

Although valid relationships have been shown to exist between total sugar concentration of some nectars and environmental conditions (Demuth 1923, Oertel 1946, Park 1929, Scullen 1940 and 1942, Shuel 1952, and Vansell 1934 and 1941), little is known about the relative amounts of individual sugars contained in nectars.

The study described in this paper was designed to investigate quantitatively and qualitatively the individual sugars in nectars secreted by some of the "bee flowers" in Louisiana. Particular attention was given to the relationship between the quantity and quality of nectars produced by white clover and satsuma blossoms and environmental factors in 1952.

Methods

All plants in these studies were grown out-of-doors.* The white clover blossoms were protected from large insects by fine mesh screened cages at least forty-eight hours prior to sampling. Mature blossoms, approximately the same age, were picked at various times throughout the day, the stems placed in water, and brought to the laboratory for processing. No blossoms were taken during obviously unfavorable weather. In the laboratory, the outer portion of each flower tube was carefully removed and two or three blossoms placed in a Bauer and Schenck centrifuge tube. The nectar was extracted from the blossoms by a procedure similar to the centrifuge method developed by Swanson and Shuel (1950).

The satsuma blossoms were picked a few hours before they would have opened in order that the nectar contained therein would be protected from large insects. The nectar in these blossoms was removed in the same manner as described above.

Samples from other plant species studied were taken at random whenever adequate blossoms could be found. The nectar was removed either by pipetting or by the centrifuge method. In some instances, bees were caught while working the blossoms and the contents of their honey stomachs removed for analysis. The removed nectars were then diluted in the calibrated Bauer and Schenk centrifuge tubes and 5-microliter aliquot samples were examined qualitatively by a

* In cooperation with Louisiana State University.

*The plant species were Alfalfa (Medicago sativa L.); cotton (Gossypium sp.); honeysuckle (Lonicera sempervirens Ait.); pear (Pyrus pyrifolia); red clover (Trifolium pratense L.); Satsuma (Citrus nobilis unshiu); white clover (Trifolium repens L.); spiny thistle (Circium horridulum Mischx); poinsettia (Poinsettia sp.).

method similar to that described by Partridge (1948) for ascending one-dimensional paper chromatography of mixtures of sugars. The positions of the sugars on the chromatograms were detected with benzidine trichloroacetate (Bacon and Edelman 1951) and aniline hydrogen oxalate (Partridge 1950).

Nectars examined quantitatively were placed on Whatman No. 1 filter paper strips and the constituent sugars separated by descending one-dimensional paper chromatography, using a solvent mixture of n-butanol, ethyl alcohol, and water. The individual constituents were then examined by a modification of the procedure developed by Flood **et al.** (1948).* All sugars were determined by use of the copper reagent described by Somogyi (1952) and are reported as glucose equivalents. The "glucose equivalent" is the analysis of a particular sugar in reference to a standard glucose solution.

Results and Discussion

Fructose, glucose, and sucrose were found in the nectar of all species of plants studied. One sample removed from the honey stomachs of bees working spiny thistle contained maltose, but a sample of nectar taken from the thistle blossoms by pipetting did not contain this sugar.

Table I gives the average concentration and concentration range of sugars and the average molar ratio of fructose to glucose in satsuma and white clover nectars for the periods of study. The fructose and glucose in both satsuma and white clover nectars gave approximately the same glucose equivalents, which suggests that these sugars are contained in these species in approximately equal molar quantities.

On the average, the amount of sucrose found in satsuma and white clover blossoms was greater than the combined weights of glucose and fructose. Also, in separate experiments (unpublished), it was shown that caged honey bees showed a preference for sucrose when they were allowed to choose between glucose, fructose, and sucrose **ad libitum.** Wykes (1952b) obtained similar results though she used slightly different technics. These results indicate that nectars containing large quantities of sucrose might be more attractive to bees than nectars containing low quantities of this sugar.

Statistical studies* revealed that there was no significant relationship between sugar concentration and either relative humidity or temperature for the periods studied, or between nectar volume yield and temperature or between volume yield and relative humidity. However, this does not imply that such relationships do not exist. These relationships could have been studied more effectively if green house facilities had been available. Such facilities would have increased the ability to control certain known variables while the effects of other variables on nectar secretion and sugar production were being studied.

FACTORS such as rain and dew affected the apparent nectar volume as well as the concentration of its constituent sugars. Blossoms examined after heavy rains usually contained larger quantities of nectar that were

*A more detailed description of the laboratory methods used may be found in a thesis by M. E. Bailey, available through interlibrary loan from the Louisiana State University Library. Because of limiting conditions not all of the white clover nectar samples were used in the chemical studies.

*The weather data and statistical analyses are included in the thesis.

Table I — Average Concentration, Concentration Range, and Average Molar Ratio of Fructose to Glucose of Sugars in Satsuma Orange and White Clover Nectars

No. of Blossoms Studied	Average Equivalent (g.%)*	Range, glucose Equivalent (g.%)	Molar Ratio Fructose/Glucose
	Satsuma blossoms for 19-day period		
117	Fructose 3.82	Fructose 1.40 - 7.80	0.92
	Glucose 4.16	Glucose 1.30 - 8.80	
	Sucrose 11.15	Sucrose 5.50 - 17.40	
	White Clover blossoms for 83-day period		
305	Fructose 6.92	Fructose 1.50 - 17.9	0.82
	Glucose 8.45	Glucose 2.10 - 18.0	
	Sucrose 26.73	Sucrose 9.90 - 50.0	

* The symbol (g.%) stands for grams per 100 milliliters.

poorer in quality than that obtained from blossoms during drier periods.

In most instances, the nectar obtained on extremely windy days was more concentrated than normally and the yield was much smaller. Another important factor in nectar production was the age of the individual blossoms at the time of sampling. Blossoms of equal age, grown under equal conditions, produced similar quantities of nectar. Blossoms picked at random contained varying quantities of nectar that differed greatly in sugar content.

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(to be concluded)

New Jersey Short Course

A three-day short course in Apiculture will be given at Rutgers University on July 14, 15, and 16. The course is open to all residents of New Jersey, the fee of $7.00 will include a bee veil for each student. Those interested in the course should contact Milton Stricker, Secretary of the New Jersey Beekeepers' Association at Annadale, N. J., or Robert S. Filmer, Entomology Department, Rutgers University at New Brunswick, N. J. Advance registration is desirable as the course will be limited to 30 students. Rooms are available near the campus for students who wish to remain at New Brunswick during the course. The annual summer meeting of the **New Jersey Beekeepers' Association** will be held at the Log Cabin on the Horticulture Farm of Rutgers University on Saturday, July 17.

The short course in apiculture will cover the basic information necessary for persons starting in beekeeping. The handling of bees, establishment and seasonal management of colonies, bee diseases, assembling equipment, nectar and pollen plants, and handling the honey crop will be discussed in the classroom and demonstrated in the laboratory and apiary.

Acid method for taking off honey

by CHARLES MRAZ,
Middlebury, Vermont

The carbolic pads. These pads have been used for many years and still are as good as ever.

IT IS MORE than 20 years since my first article was published in Gleanings describing the use of carbolic acid to drive bees out of surplus honey supers. Many tons of honey have been taken off of hives since then with the carbolic method. It might be well to review the technique and changes that have occurred since its use was first described in my early articles. There are many beekeepers who do not take advantage of its labor-saving advantages for various reasons, and these should be discussed to overcome any real or imagined objections.

The Carbolic Pads

While these have been manufactured, most beekeepers have made their own with the result that there are as many different kinds of pads as there are makers. Many beekeepers cannot help but add their pet ideas which might make the pads easier to use. I'm as guilty as anyone in making pads with all kinds of possible improvements, but the plain, simple design I first made seems to work as well as any and better than most.

The frame for the carbolic pad should be the same size as the super and at least one inch deep. Some believe they should be deeper to make more space between the combs and the acid cloth. Personally, I don't think it makes too much difference if the depth is one inch or three inches. If the frames are made too deep, they get too bulky to handle.

The next and important part of the carbolic pad is the cloth that absorbs the acid. Here, too, there seems to be a variation of ideas. Some use a thin layer, perhaps just one thickness of cheesecloth. I myself favor the other extreme and like to use about five thicknesses of muslin.

A thin layer of cloth of course can absorb only a small amount of acid and has to be dampened with acid frequently. With a heavy layer of cloth, quite a bit more acid is absorbed and one application will usually last a whole day and perhaps two days, depending on conditions. Also, with more cloth, there is less chance of any acid dripping from the cloth onto the honey. Some may argue that the pad will work faster with a thin layer of cloth since the heat of the sun will penetrate to the acid faster. Actually, I don't believe there is enough difference in this respect to be noticed. More beekeepers, I believe would be satisfied with a heavier layer of cloth as an insurance against acid dripping off the pad. If one uses hired labor and doesn't want to depend on them applying acid on the cloth, this can be done in the morning by the beekeeper before going to the yards and it will be enough for a full day's operation.

A small amount of carbolic acid is sprinkled on the cloth. Notice the cloth is not saturated completely, to make sure there will be no chance of any acid dripping off the cloth. It does not make the acid pad work any faster to put on more acid.

The Top Covering

Everything from tar paper to sheet iron has been used for the top covering, but after trying everything I have found galvanized sheet iron the best for all purposes. Many have the idea it should be black iron since it absorbs the heat of the sun more readily. However, when the sun is shining, one has to worry about the pads getting too hot, rather than not hot enough.

There is no advantage in having the metal on a carbolic pad getting more than just warm. Excessive heat causes too much evaporation of the acid. If the sun is not shining, then there is no advantage of black metal as there are no sun's rays to be absorbed.

A metal cover for a carbolic pad is a must. With its other advantages, it makes a strong and rugged assembly and if built well, such a carbolic pad will last many years.

The Right Acid Important

THE NEXT important part of the carbolic-pad system is the acid itself. While it is called an acid, it really is phenol alcohol. This material should always be used in the pure, refined state. Crude carbolic acid should never be used as it will taint the honey. Some have made the mistake of using a rather large amount of water with the acid. In fact, my early articles specify half and half. However, the acid should not contain any more water than needed to keep it in a liquid state. This is usually about 15 per cent water, which is the amount used when acid is bought in the liquid state.

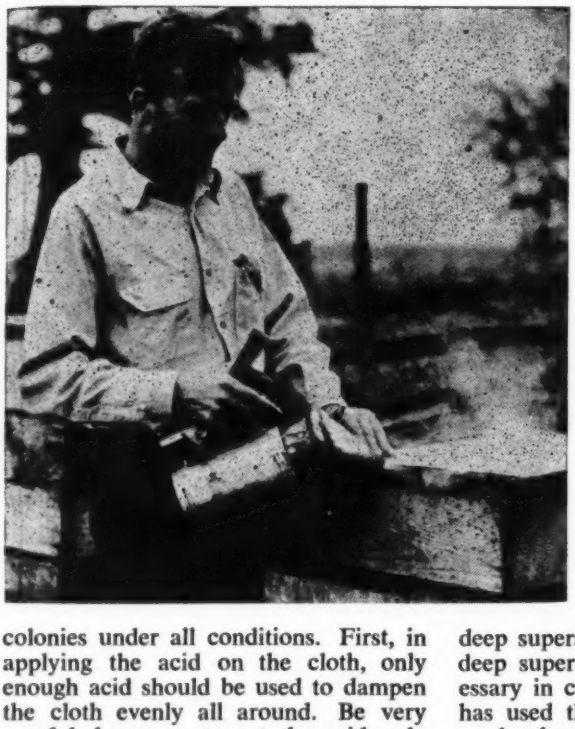
If bought in the liquid state, use it just as it comes from the bottle. Some of you who are skeptical may ask, why not add more water? The reason is very simple; when the acid is applied on the cloth and the pad is used, in a very few minutes all the water evaporates, so why bother putting it on.

Some have tried adding alcohol or other materials to the acid with the theory that it helps the acid work better in cool weather. Actually, it doesn't help at all and should not be used. Even in cool weather, any alcohol added to the acid evaporates in a very few minutes after it is applied on the cloth.

Never use anything but pure carbolic acid. Some have tried to capitalize on this system by selling materials with fancy names and prices as a substitute for carbolic acid. There are many other substances that will drive bees out of supers, such as formic acid and cresols, but many of them will taint the honey or not do as good a job. So far, I don't know of anything as good as pure $C_6H_5(OH)$.

The Best Way to Use the Pads

I cannot say that I have the best system, but I have used the carbolic system for 22 years on hundreds of



In cool or cloudy weather, the pad can be placed on the super tightly. Some smoke blown under the pad into the super will help get the bees moving down out of the super. The carbolic pad will work successfully, though slower, as long as bees can move at all. When bees are stiff with cold, nothing can get them out until they are warmed up.

colonies under all conditions. First, in applying the acid on the cloth, only enough acid should be used to dampen the cloth evenly all around. Be very careful, however, to get the acid only on the cloth and nowhere else. I usually take a hive tool and spread the acid around on the cloth to make sure it is completely absorbed. It is most important that no acid drip from the pad onto the honey. If this happens, then the honey will be tainted.

Even just one drop of acid falling on a super will taint a large amount of honey. The vapor itself apparently will not cause any trouble, but just the tiniest amount of the liquid acid will.

I've heard that the carbolic system is too expensive. This rather puzzled me, as we figure one pound of carbolic acid will take off five tons of honey. At a dollar a pound, it makes just 20 cents worth of acid to take off a ton of honey. No one can call that expensive.

How many pads does one need? We have found five pads are enough for two people taking off supers from a fairly good sized apiary. Some use more. Much depends on conditions. If one uses shallow supers as we do, they come off much faster than the deep supers, and five is enough. With deep supers, perhaps ten may be necessary in cooler weather. Anyone who has used the carbolic system knows it works best in warm sunny weather. That is when honey should be taken off.

In warm weather we never put a pad tightly on a super. It is usually put on cross ways or slid back from the end a half inch or so to give the bees a chance to get out through the top of the super as well as the bottom. We usually don't put on any more pads than necessary. There is really no point in driving the bees completely out of the hive. Leave them on only long enough to drive the bees out of the top super. We put the five pads on the supers of five hives. By the time this is done, the bees are out of the first super. This is taken off and the pad put back on if there are more supers on the hive. As soon as one hive is done, then it goes immediately on the next hive, and so on until either the truck is loaded or the yard is finished.

The problem always comes up, what shall one do in cool or cloudy weather? Of course, we can't always take off honey in nice sunny weather. We get along very well even under cool or

(Continued on page 442)

Slumgum and its relation to American foulbrood

by J. E. ECKERT, University of California, Davis

THE QUESTION is asked rather frequently as to whether slumgum resulting from the rendering of AFB combs still contains viable spores of this disease. Some state laws require that all slumgum be burned or so disposed as to be made unavailable to bees.

Due to the need of adopting stringent measures for the reduction of all forms of smoke in an effort to reduce smog in some parts of the country, ordinances are in effect, or are being proposed, that prevent the burning of refuse from wax extraction plants (although not so specifically stated).

In the process of producing or salvaging beeswax from combs infected with American foulbrood, the combs are first melted from the frames and then boiled in water for an hour or more until the beeswax in the combs has become thoroughly melted. Live steam is generally used as a source of heat in order to reduce the fire hazard.

In commercial plants, the melted wax is run or dipped off the surface into molds and allowed to cool slowly so the blocks do not crack. These blocks of wax are later melted again in boiling water and the wax allowed to clarify slowly or is run through a filter press at a rather high temperature, before molded again for commercial purposes or for making comb foundation.

The refuse from the combs contains among other things, numerous cocoons of silk secreted by the bee larvae and these small bags of silk prevent much of the wax from rising to the surface of the boiling water. This refuse is dipped into presses between layers of heavy burlap and heavy pressure is applied to the mass which is kept hot by live steam. The pressure is generally released and applied intermittently in order to thoroughly wash and press the wax from the cocoons and until no more wax can be secured.

Obviously, during this process of boiling, pressing, and washing, all of the honey is removed from the slumgum as well as practically all of the beeswax. The amount of wax left in the slumgum depends on the efficiency of the heating and pressing process. When dried, the refuse should be crumbly and dry. If it should stick together or show much evidence of beeswax when exposed to dry in the sun, the rendering process has not been efficient.

The water used in the rendering process is usually run into a sewer system or into a septic tank. The scales formed by the larvae dead of the disease generally become disintegrated and portions run off with the water or disperse throughout the slumgum.

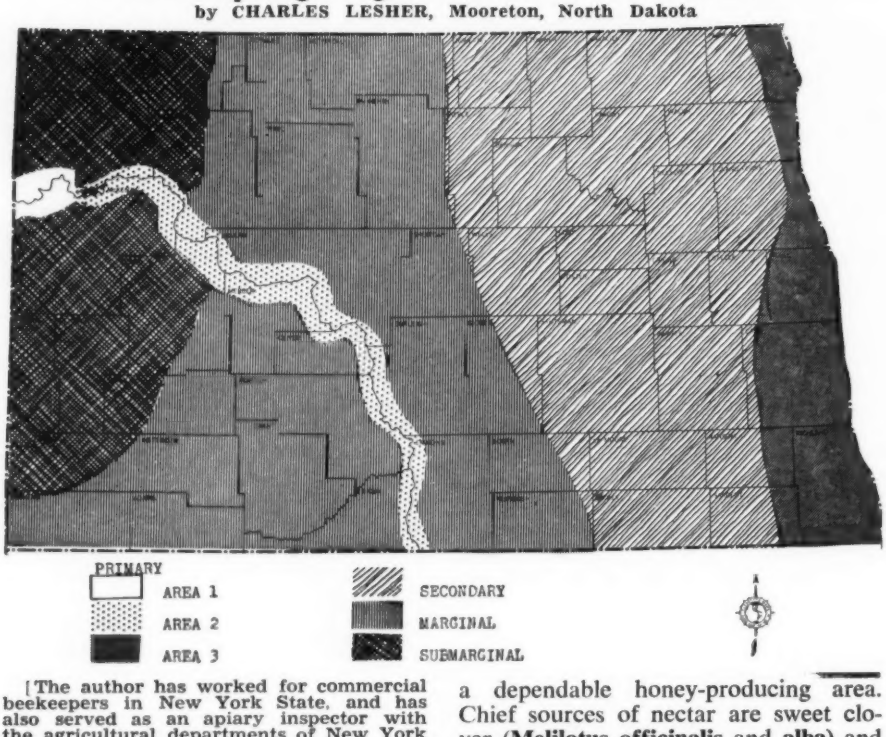
The answer to the question of whether or not the slumgum still contains spores in condition to cause the disease may be complicated by the efficiency of the rendering process. If an insufficient amount of steam and water is used to dissolve and carry away all of the honey in the combs, the refuse might contain some honey which might, conceivably, hold some viable spores and also make the cooled slumgum attractive to bees. But when the process is done efficiently, bees pay very little attention to slumgum when it is thrown out in the open to dry, preparatory to further disposal.

TO DETERMINE if bees could secure enough spores from slumgum to cause the development of AFB in their brood, two samples of slumgum were secured from two California wax salvage plants after the wax had been rendered from diseased combs by the usual process. Between four and five pounds of each sample of slumgum were heated in a gallon of water until the particles were well separated and thoroughly mixed by stirring. The solution was then strained through cheesecloth and used to make two gallons of sugar syrup, which were

(Continued on page 431)

Beekeeping regions of North Dakota

by CHARLES LESHER, Mooreton, North Dakota



[The author has worked for commercial beekeepers in New York State, and has also served as an apiary inspector with the agricultural departments of New York and North Dakota. He is a graduate of North Dakota Agricultural College, and presently operates more than 800 colonies in that state. We believe that Mr. Leshers' North Dakota experience, as a former inspector and now as a commercial beekeeper, makes him an authority on this subject.—Editors.]

FOLLOWING THE EXAMPLE of the other authors of this series on beekeeping regions, it seemed best for me to classify the beekeeping regions of North Dakota into four types, namely: primary, secondary, marginal, and submarginal areas.

Primary

Area 1. Most important in this area is the fabulously rich Red River Valley. This valley, which extends from the river bank 30 to 40 miles westward into the state, was once the bed of a great glacial lake.

The Red River Valley is devoted principally to grain farming. Potatoes and sugar beets are becoming increasingly important. Enough legumes are grown, however, to make this region a dependable honey-producing area. Chief sources of nectar are sweet clover (**Melilotus officinalis** and **alba**) and alfalfa (**Medicago sativa**). Scattered acreages of buckwheat (**Fagopyrum sagittatum**) in Richland County can provide enough nectar to darken light honeys.

Fortunately for the beekeepers in the southern end of the valley, sweet clover is used in the crop rotation and is either plowed under in the crop rotation or raised for seed. The situation is helped further by the abundance of sweet clover growing wild in ditches and along roadsides.

Some basswood (**Tilia** spp.) trees are present but they are not generally regarded as an important nectar source. Trees in the vicinity of the river and streams are useful in providing sheltered locations and as a source of pollen.

Area 2. Bottom Lands of the Missouri River Valley. These are restricted in area and are used extensively for alfalfa hay production. Sweet clover and alfalfa are dependable nectar sources here even in dry years. On

occasions sweet clover belatedly springs up on the river sand bars after spring flooding to provide a retarded honey flow. Trees in the valley furnish early pollen.

Garrison Dam, now under construction across the Missouri River, will form a reservoir 200 miles long, flooding some of the finest bottom land. A similar dam in South Dakota will flood sections of the southern half of the Missouri Valley in North Dakota.

Area 3. Irrigated Region. Only one area in North Dakota is irrigated to any extent at present. This area is west of Williston in the Missouri River Valley and is known as the Fort Buford irrigation district. It extends into Montana.

Nectar flows are dependable in the irrigated areas because of the acreages of alfalfa. Scattered growths of sweet clover are encountered. Unfortunately, there is no fall flow here.

Secondary

West of the Red River Valley and occupying about half of North Dakota, is the "Black Earth Belt". In this zone soils are dark, moisture conditions are favorable, and farming is devoted largely to grain and fibre crops.

If farm practices change in this area, and more nectar-secreting plants replace the grain and fibre crops, the "Black Earth Belt" could become excellent territory for honey production.

Marginal

West of the secondary area described above, and also west of some parts of the Missouri River, is cattle and wheat country, which may be considered marginal for honey production.

Rainfall is low here, and there are fewer legume crops. Topography is rougher than in eastern North Dakota, and the soils are lighter. The Mouse River Valley is probably the best area in this territory for honey production.

Submarginal

West of the Missouri River the light clay soils are easily eroded by rains and wind. Here are the picturesque "Bad Lands". Low moisture supply and scarcity of honey plants makes this region unattractive to beekeepers.

Conclusion

None of the soils in North Dakota are lime deficient. If the moisture supply is right, sweet clover and alfalfa thrive. Beekeepers in some northern areas report Buckbrush (**Symphoricarpos orbiculatus**) as a source of nectar. This plant is also known as coral berry and Indian currant.

As farming and farm practices change in North Dakota, so will the beekeeping opportunities. And any place in the state with large acreages of sweet clover or alfalfa is a potential honey-producing area. At present there appears to be a trend toward more alfalfa production.

Plans are being formulated to use the waters impounded by Garrison Dam for a system of irrigation projects. The first irrigation development may be ready in a few years. Irrigation will be made available as far east as Dickey County and that may develop new beekeeping territory. Thus parts of what is now a secondary area may develop into primary territory.

There are some counties in the state where not even a SINGLE COLONY was registered with the state inspector in 1952. The low population of bees in some of these areas gives us little data on the actual value of certain localities for honey production. Irrigation and improved farming should provide new opportunities, which if properly handled, will bring a bright future to North Dakota beekeeping.

"Since I hired that Hindu faker, I've thrown away my ladder."

Let's have an old-fashioned bee tree hunt

by GEORGE H. DAY, Scranton, Pa.

Bee box holding baited comb.

THE LACKAWANNA COUNTY Beekeepers' Association of Scranton formed a committee to create public interest in — Bees — Honey — Pollination — and other by-products.

We were looking for a publicity stunt that would let the general public know honey was being produced and pollination service was available locally. An old-fashioned bee tree hunt was suggested and the next thing I knew I was the chairman of the committee.

Most Americans seem to have just a bit of Indian blood when it comes to the great outdoors, hunting, fishing, camping, or just plain hiking.

One of the few sources of sweets to pacify the sweet tooth of the Indians and early settlers in America was wild honey, found in bee trees and rock ledges.

Most of the younger generation have heard stories about "bee tree hunting" from their grandfathers if they lived in the country, but you seldom find anyone who has ever been out "coursing bees" for an afternoon, or have any idea how it is done.

The first thing we did was set the date for a fall Sunday afternoon in October at 1 P.M. sharp. Mr. Robert Hull, Jr., who has a large farm specializing in honey products and sheep, mentioned he had noticed a considerable number of black bees around the farm that were not from his apiary.

Black bees are a good indication that they are wild bees. Mother Nature provides them with a hotter, longer, sharper, stinger than other bees. At least that is what I have always imagined.

Mr. Hull's farm was selected as the site of the hunt, and the public was invited. Newspapers and radio commentators gave us wonderful publicity. Two newspapers sent reporters and photographers to cover the event.

Finally the day of the bee tree hunt arrived, and it was a delightfully clear fall day. The committee was on the job at 10 o'clock in the morning. The first thing we did was to catch some bees in an empty water glass while they were working on fall flowers. The captured bees were placed on a small piece of honey comb approximately three by three inches, baited with sugar syrup, with a drop of anise added for extra aroma. Six sets like this were placed in a line 500 to 1000 feet apart, with captured bees placed on each set. This would give the bees approximately two and one-half to three hours working time before the guests arrived.

Then we asked all surrounding neighbors for permission to hunt on their property, and cut a bee tree if we were lucky enough to find one. They all gave us their permission and some of them joined the hunt. After a wonderful dinner as guests of Mr. and Mrs. Hull, we set up a table with all the paraphernalia used in hunting bee trees. Each item had a three by five inch card attached with a typed explanation of its name and use.

Then the guests began to arrive in cars, trucks, school buses, and on foot. We were pleased and amazed when we counted noses that 247 turned out.

We got them together around the table and explained each item in detail, and how it fitted into bee tree hunting, answered all questions, and we were off.

At the first set we picked up the baited comb covered with bees, and carefully put it in our bee box without disturbing the busy bees that were filling up on sugar syrup. This box has a glass top and a slide door, so that one bee can be released at a time. When we released the first bee, she made two and a half circles and flew "bee-line" northwest. The next release went due south, we wrote her off as one of the Hull's bees, three more were released and flew northwest, on the same course as number one. We closed up the bee box and carried it due north almost to the next set, and released three more good-looking black bees. They all went northwest. At number two set we just observed the working flight pattern which was predominantly westerly, with a few light-colored three-banded Italian bees taking a southern course to Hull's apiary.

Number three set had no bees on it. Number four set was working well, and the bees were flying a southwest course. We released two from the box from number one set as a check, and both flew southwest.

At each set as the bees were released or observed taking off loaded with sugar syrup, we all followed them with our eyes on the proverbial "bee-line". Incidentally a person with average vision can follow a honey bee in flight on a clear day, against a blue sky, for an unbelievable distance, usually 1000 to 2500 feet.

After we were satisfied on the general flight pattern at each set, we would take a bearing on an object like a big rock, or a dead tree on the hillside. We would pick something we were sure we could see from the next set. This would give us a rough triangle on flight pattern and the tree location.

One of the regrets of my life is that I did not get a moving picture of the crowd, all turning their heads like chickens, and ducking in unison on the first circle of the released bee trying to gain altitude.

By this time we had a good idea of the general location of the tree. We all spread out 247 strong, and started in the direction of the flight. I suppose every tree from one and one-half inches in diameter up, was carefully inspected by at least three people, in the frantic search that followed.

Bee Tree is Located

By this time the excitement was unbelievable. The center of the line started to yell and whistle, and sure enough they had found a big hemlock, with bees going in and out, which we hoped would be full of wild honey. Despite warnings, everybody wanted to get a good look, quite a few got "stung" and the hot news spread fast.

With some sulphur in a bee smoker we soon quieted the bees. The cross cut saw gang had the tree down in no time and a section split out filled with honey. Wooden spoons were passed out, and everybody had a sample of delicious wild honey that they had actually had a part in locating.

Some of the most enthusiastic ones cut out sections of comb, and ate it like cake. I personally do not recommend this method of eating honey unless you are in the dry cleaning business. Take my word for it.

By this time it was 5:30, and we all started for home, tired but with a deep and sincere understanding and appreciation of one more of the wonderful workings of God and Mother Nature, in providing us with the things we need.

The members of our bee club will all tell you that this created tremendous interest in bees generally. When their neighbors and friends asked questions about the "Bee Tree Hunt", it gave them the opening and opportunity to talk about, and sell honey—pollination service, and point out how dependent each of us are on the "busy little bee".

Three of the guests on the bee tree hunt have each decided to order a package of bees, and begin to enjoy with us the profitable, fascinating experience only available to a "BEE MAN".

Our Cover Picture

The unusual cover drawing is by Charles M. McAuliffe of Bernardsville, New Jersey.

Equipment for processing honey

by E. BRAUN*, Ottawa, Canada

Part II

Experimental Procedure

THE APICULTURE DIVISION at the Central Experimental Farm, Ottawa, Ontario, set up a project in 1950 to study the continuous-flow method of processing honey, in co-operation with the Agricultural Engineering Section of the Field Husbandry Division. The project was divided into three methods of approach: (1) a small-scale laboratory model; (2) modifying existing dairy pasteurizing equipment for the commercial honey processor; and (3) constructing a low-cost tubular unit for the smaller independent packer or commercial honey producer.

1. **The laboratory model:** Coiled and straight tube Graham condensers were connected in series or used singly to simulate a processing unit. A hot-water bath, with temperature controls, was used for heating and a cold-water bath for the cooling system. It was demonstrated that honey could be continuously heated and cooled satisfactorily, on a gravity-flow basis. A four-degree temperature differential was required between the cooling medium and the honey to provide a flow rate of approximately two pounds per hour. The laboratory model demonstrated the feasibility of a continuous-flow system for processing honey.

Batch heating and cooling tests. The double-walled junior pasteurizer, with a slow speed agitator, installed for use as a preheat tank for the plate-type heat exchanger was used to test the heating and cooling of honey on a batch basis.

Batches of 350 pounds of **liquid honey** were heated from 76 - 170°F. in approximately one and one-half hours and cooled from 170 - 80°F. in three and one-half hours, with the coolant at a temperature of 50°F.

Batches of 350 pounds of **granulated honey**, depending somewhat on their moisture content, varied in heating (78 - 170°F.) between two and four and one-quarter hours, and cooling from 170 - 96°F. took approximately two hours with the coolant varying between temperatures of 50 - 60°F.

It is evident from the above that there was a time-lag both in liquid and granulated honey when heating and cooling were done in the same kettle on a batch basis. This time-lag has presented serious bottlenecks in the honey-processing industry.

2. **Plate-type heat exchanger:** A double-walled preheat tank with agitator, a positive-type wobble pump, a plate-type heat exchanger with a holding pipe, and a holding tank to handle approximately 25 gallons per hour was installed. A steam boiler, circulatory pumps, mixing valves, etc., were used to provide hot or cold water as required.

The plate-type heat exchanger, with a capacity of 345 pounds of honey per hour, will utilize liquid or semi-granulated honey either at 80° or 100°F., heat it to 170°F., or pasteurizing temperature, hold it for three minutes and then cool the honey to 80°F., or slightly less in a total time of six minutes and do it continuously. The main disadvantage, at present, is that a 19 per cent moisture content honey will provide a pressure of 22 p.s.i. on the plates and a 15 per cent moisture content honey 42 p.s.i., while the manufacturer's specifications place a maximum limit of 25 p.s.i. on the plates for safety purposes. New and heavier plates to withstand 100 p.s.i. are being manufactured and they will be tested as soon as they are available. The cost of this equipment, in stainless steel, varies with the volume to be handled, and ranges from $4000 to $8000 without installation costs. The advantages are that the equipment can be easily dismantled, cleaned, has a relatively low operating cost, and can be expanded or contracted to suit the volume of honey to be handled.

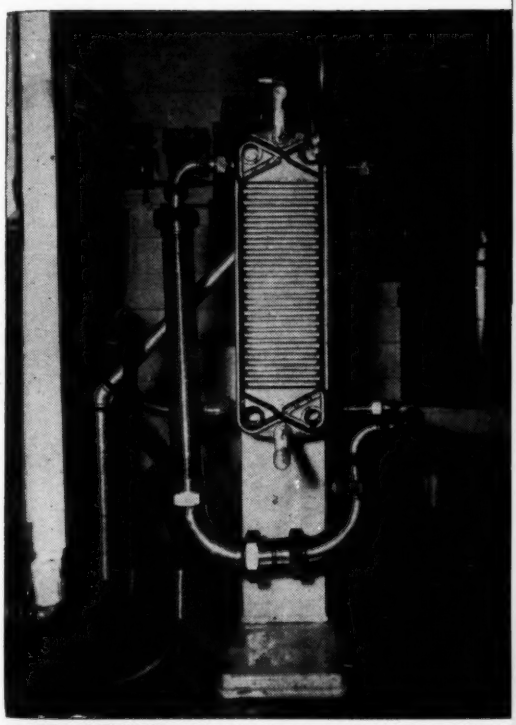
3. **Tubular unit:** This unit was made up of a preheat tank, a positive displacement gear pump, a pasteurizing,

*Senior Apiculturist, Apiculture Division, Central Experimental Farm, Ottawa, Ontario, Canada.

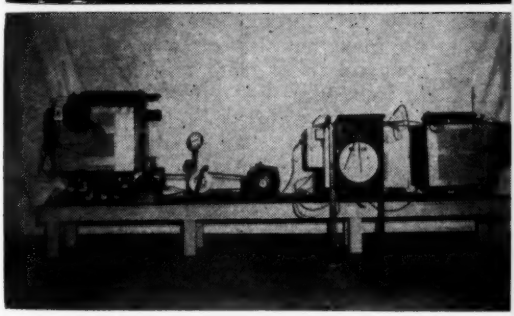
and a cooling tank. The preheat, pasteurizing, and cooling tanks are primarily water baths, heated by electric immersion heaters, thermostatically controlled. Motorized stirrers in the heating and cooling tanks helped to maintain uniform temperatures throughout the baths. The honey is pumped through coiled copper tubing immersed in the baths. The details on the size, length, and arrangement of the copper tubing will be published as a separate manuscript. Back pressures on cooling were so high that a by-pass had to be provided at the pump for safety purposes.

Honey, with varied moisture content, and at varying temperatures, has been heated and cooled satisfactorily and in sufficient volume to demonstrate the feasibility of this equipment for continuous processing on a beekeeper-packer scale.

Pumping seed honey into the outlet line is presently undergoing trials, at varying temperatures, to ascertain the distribution, time, and temperature relationship required for a rapid set and finely-textured honey. The cost of this equipment is in the neighborhood of $1500 and has the advantage that it can be assembled wherever electricity, water, and a tinsmith are available.



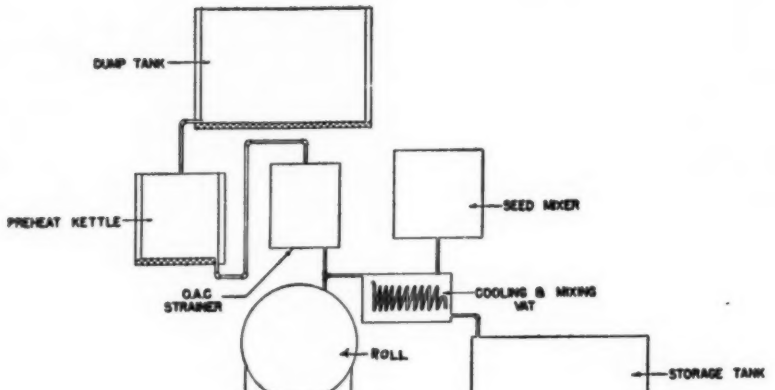
Heat exchanger with plate exposed. Holding pipe in foreground extending from the heating to the cooling section.



Tubular heat exchanger. Left to right—preheat unit, positive drive pump, variable speed controller, heating unit with temperature controller, and cooling unit.

Other equipment: The breakdown in the crystal texture of recrystallized honey, having a moisture content above 18 per cent has been demonstrated by Austin and Jamieson (1) in a honey of high levulose/dextrose ratio after four and one-half months of storage at room temperature, and would indicate that a constant moisture in the recrystallized pack may be desirable. A preliminary project was set up to test a **continuous vacuum-type** of heat exchanger used in the food industry. Water-white and dark honey, of varying moisture content, was used to determine whether the honey could be treated without damage to the color and aroma. A very slight change was evident in the color, shortly after treatment, but additional color readings must be made over a longer storage period before the ultimate effect may be measured. No detectable flavor changes occurred but a taste panel check will be necessary to verify or disprove this contention. The water evacuates were decidedly aromatic, especially from buckwheat honey but the total removed, depending upon the original moisture content,

SCHEMATIC SET-UP FOR PROCESSING HONEY



System generally employed in honey processing plants in Canada. Either roll or cooling and mixing vat are used but not together. Black dots denote heat. The strainer, roll and cooling vats are exposed to air-borne yeasts after pasteurization in preheat kettle.

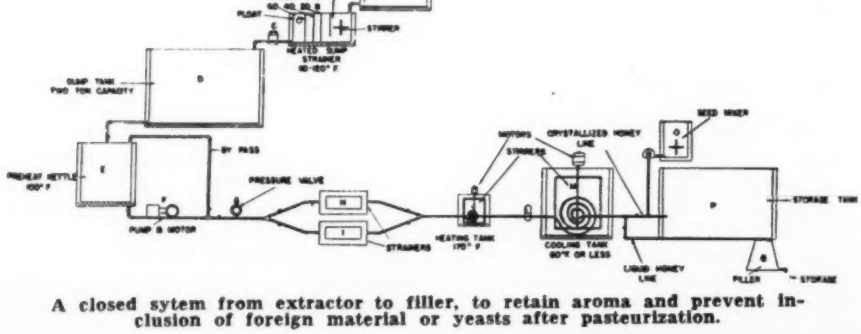
the amount of vacuum used and the flow rate through the equipment may or may not be of any very large concern. Pilot plant tests are required to measure this effect. Drying the honey to a brittle candy form was accomplished. The quality and color was excellent but the economic feasibility of making such a product would have to be determined. Cooling with vacuum and other tests are still in progress.

Cooling honey in a rotator-type of machine, used for ice cream manufacture, is also undergoing trials.

In conclusion, the viscid, aromatic, heat sensitive, and crystallizing nature of honey, together with the presence of yeasts and molds, implies the use of continuous flash pasteurization, with adequate heating and cooling temperature controls, in a closed system. The following is an ideal set-up envisaged

(Continued on page 443)

SCHEMATIC IDEAL SET UP FOR PROCESSING HONEY



A closed sytem from extractor to filler, to retain aroma and prevent inclusion of foreign material or yeasts after pasteurization.

Cool

by MRS. BENJ. NIELSEN
Aurora, Nebraska

Honey pineapple chiffon pie—a cool treat for hot days. —Photo courtesy Kellogg Co.

LEMONADE concentrate, made in the cool of the morning, is a must for refreshing, thirst-quenching drinks that furnish excellent quick energy. Just squeeze lemons, add honey to taste to the juice, or part sugar, if desired, and refrigerate in tightly-covered jars. Water, plus ice cubes—lemonade in a twinkling, no trouble at all!

If you remembered to water the rhubarb faithfully through dry spells you can enjoy some of these doubly delicious treats throughout the entire summer. Happy quick-cooking to you!

Honey Pineapple Chiffon Pie

Crumb Shell: Four cups corn flakes, ¼ cup butter, and 2 tablespoons honey.

Crush cornflakes into fine crumbs. Melt butter; add honey and crumbs, mixing thoroughly. Press evenly and firmly around sides and bottom of an 8-inch pie pan. Bake in a slow oven 325°F., about 10 minutes. Cool.

Filling: One tablespoon unflavored gelatin, ¼ cup cold water, 3 eggs, separated, ⅔ cup honey, ½ teaspoon salt, 1 teaspoon grated lemon rind, 1 tablespoon lemon juice, and 1 cup undrained pineapple.

Soften gelatin in cold water. Beat egg yolks slightly; combine with ⅓ cup honey, salt, lemon rind, lemon juice, and pineapple. Cook over hot water, stirring constantly, until mixture thickens. Remove from heat. Add softened gelatin, stirring until dissolved. Cool until mixture begins to set. Beat egg whites until stiff but not dry; beat in remaining honey. Fold into gelatin mixture. Spread lightly in honey crumb pie shell. Chill.

Honey Frozen Strawberry Dessert

One envelope vanilla flavor frozen dessert mix, ¾ cup milk, 2 cups strawberries, ⅓ cup honey, 1 teaspoon lemon juice.

Pour mix into bowl and stir milk slowly to make a smooth mixture. Pour into cold dry freezing tray; freeze until firm about one inch around edges. Crush strawberries, stir in honey and lemon juice. Place partly frozen mixture in chilled bowl and beat until double in bulk. Blend strawberry mixture in thoroughly; pour back into freezing tray. Freeze until firm, stirring with a fork after about 30 minutes.

Honey Dessert Royale

One and ⅓ cups fine honey graham-cracker crumbs, 2 tablespoons honey, ¼ cup melted butter, ½ teaspoon cinnamon, 1 pound rhubarb, ½ cup honey, 1 envelope unflavored gelatin, 2 egg yolks, ⅓ cup honey, 1 cup cream-style cottage cheese, 1 tablespoon lemon juice, ⅛ teaspoon salt, 2 cups strawberries, halved, 2 egg whites, and ½ cup whipping cream.

Blend graham-cracker crumbs, honey, melted butter and cinnamon. Reserve ⅓ cup mix for topping and press remaining mix firmly over bottom of baking dish 10 x 6 x 2. Chill until firm. Cook rhubarb with honey. Drain and measure syrup, adding water to make ½ cup. Soften gelatin in ¼ cup rhubarb juice. Beat egg yolks in top of double boiler; add honey and remaining rhubarb juice. Cook, stirring constantly over simmering water until mixture thickens slightly. Blend softened gelatin into hot egg mixture; cool. Sieve cottage cheese into large bowl; blend in lemon juice and salt; stir in cool egg mixture; fold in halved strawberries and drained rhubarb. Beat egg whites until stiff but not dry. Fold into fruit mixture lightly. Fold in whipped cream. Pour into crumb-lined pan; spread evenly; sprinkle remaining ⅓ cup crumb mixture around top edge to make narrow border; chill until firm.

Editorials

Will Beekeepers Ever Learn?

THERE IS a difference between a beekeeper and a keeper of bees. A successful beekeeper discovers the principles of beekeeping that govern success, then applies these principles to his business. If he does that he is likely to succeed, provided, of course, conditions are favorable for nectar secretion.

The keeper of bees may not be particularly interested in securing the maximum crops of honey, in fact, if he gets one super or even a part of a super, to supply some honey for table use, he is satisfied.

This type of beekeeper may not be doing the industry much good, but his bees do help to pollinate farm crops and in this respect he is rendering some service.

The successful beekeeper is not only salvaging a part of the nectar that is available each year but he is also rendering a pollination service to agriculture.

One thing that seems to be hardest for beekeepers to learn is to leave enough food for the bees during winter and early spring. The use of the sectional hive has made it easy for beekeepers to remove more honey at the close of the season than is their rightful share, thus leaving the bees on short rations until the following season when the major honey flow begins.

As has been stated previously, more bees die from starvation than from any other single cause. It takes approximately a full comb of honey to produce a full comb of brood, also approximately one pound of pollen to produce one pound of bees.

Some beekeepers have learned about the importance of reserving an ample amount of food for their bees, but many more have yet to learn it.

Can "Bee Fever" Be Cured?

THE TERM "bee fever" is commonly applied to the frenzied interest most beekeepers have in bees, especially early in the spring or when there is a good honey flow on.

There may be an occasional beekeeper who does not become thoroughly inoculated with this fever and consequently has a rather passive interest in bees. Such a beekeeper may become easily discouraged and if the going is too rough, he may decide to drop out and take up some other line of work.

The beekeeper who has become thoroughly inoculated and has been in this business for a number of years is likely to continue through thick and thin. Our industry at present is in need of more enthusiastic beekeepers who really believe in their business.

If beekeeping conditions improve in the near future and if honey prices are thoroughly stabilized and advanced far enough beyond what they are at present, to give beekeepers a wider margin of profit, they are going to feel encouraged and our industry is likely to progress more rapidly than it has during the past few years.

In any event, our industry needs more beekeepers who really have the "bee fever", for which there is no cure.

More Jobs or More Students?

A NUMBER of leaders in our industry have indicated that more young men should attend our agricultural colleges and take advanced training in apiculture. This might be like placing the cart before the horse.

We believe that the industry should first concern itself with creating more jobs for advanced beekeeping students rather than trying to encourage more young men to enter colleges and then have them leave the field after graduation for lack of employment. That is the current situation.

We know of a number of advanced beekeeping students who are adequately trained in beekeeping science and practice under an outstanding beekeeping specialist, and then gave up beekeeping for other lines of work since no positions were available. Their services and leadership are lost to us. Talks with beekeeping teachers at agricultural colleges indicate that the situation is prevalent throughout the country.

This situation can be altered through the aid of the American Beekeeping Federation. How? This national organization could act as an employment center for young trained men in apiculture. Within a year of their graduation their names and records could be submitted to Mr. Frank A. Smola, Executive Director of the Federation, so that when a job opens this information could be forwarded to prospective employers.

Deans of agricultural colleges could be notified of this new function of the Federation and made to realize that qualified beekeeping students can now be obtained at a minute's notice. Undergraduate beekeeping students should be invited to file with A.B.F. so that an inventory of future beekeeping specialists would be known. Canadian agricultural colleges should be asked to participate in this program as they have contributed a lot to the American beekeeping industry. Beekeeping professors should be encouraged to file scholarship openings so that the information could be made available to young men through the Federation News Letter and the bee journals.

Only when we take an active interest in the future of our young beekeepers can we encourage them to take advanced instruction. Then a fellow could enter college with at least a bright outlook for future employment.

Have Platter Right Side Up

A WHILE BACK beekeepers in this area had long faces. Bees got practically no honey from fruit bloom and dandelion because of cold weather. Colonies that had been populous, with adequate stores earlier in the season, ate up their honey and hive populations began to dwindle. Bees had to be fed to keep them alive. Many tons of sugar were fed, especially by commercial beekeepers. Some beginner beekeepers lost their bees from starvation. Copious rains and humid weather have changed the picture almost over night. Clovers have sprung into bloom and are yielding nectar. According to one commercial honey producer in Western Ohio who drove to Medina for bee supplies today, June 17, beekeepers are piling on supers.

Some beekeepers had not given enough supers earlier and are now having swarms . Those who had put on an ample number of supers prior to the beginning of the flow controlled swarming and now have most of the supers filled. It is amazing what populous colonies will do in a few days when conditions are right for nectar secretion.

It seems difficult for beekeepers, especially beginners, to realize the importance of supplying ample comb space in time to avoid congestion within the hives which is said to be the main cause of swarming. Many carloads of honey are lost each season because of insufficient comb space, which means supers, for the storage of incoming nectar, which is approximately 66 per cent water, the amount depending on its sugar content. The bees reduce the nectar down to the consistency of honey by fanning their wings to drive off the excess moisture.

Larger crops can be secured by having the platter right side up which means putting on supers before colonies become crowded.

A hard-working bee in the west

by CLARENCE TONTZ, Elsinore, California

Hand-selected alkali bees in pre-pupa stage are being put into blocks for transportation by Herman Menke, authority on these bees.—Photo courtesy FARM MANAGEMENT MAGAZINE.

WESTERN BEEKEEPERS who rent their bees out for alfalfa pollination services may soon run into tough competition (in fact, ousted in some areas) from a hard-working wild bee whose habits are being cultivated by man.

Seven years ago in the Yakima Valley of Washington it was discovered that many wild bees were working the new alfalfa fields located near poor land with alkali soil. The seed crop yield was tremendous. Investigation proved that one particular kind of wild bee, commonly called the "alkali bee", was doing the good work.

This native bee is credited with enabling Yakima Valley to produce the highest seed yields in the United States. Many of the fields yield 600 pounds or more of seed to the acre. The average is between 700 and 800 pounds with some fields crowding 1000 pounds of seed per acre. It is interesting to note that before alfalfa seed production spread to fields located near the alkali bee's home grounds, the state's average yield was only around 200 pounds.

In some areas the population of the alkali bee is quite high and recently experiments have been carried out to determine if adequate numbers of the bees can be successfully transferred to new areas being opened up for alfalfa seed planting.

Attracting a lot of attention was the transfer of 3000 of the bees from Harrah to Quincy, Washington, by Herman Menke, fieldman for the Andrews Seed Company and former professor at Washington State College. For moving the bees, Menke used a method worked out by Dr. G. E. Bohart of the Legume Seed Research Laboratory at Utah State Agricultural College. The method is simply to bore holes in short two-by-four boards and place the bees (in the pre-pupa stage) in the holes. The holes are sealed over with beeswax. At the new place the blocks are buried under two to four inches of moist soil.

Propagating this diligent bee is still in the experimental stage, but western scientists and farmers are watching and working hard to make it a success. They will leave no stone unturned to make it work. Why? Because the pollinating activity of this bee is phenomenal! A single female will work

Three thousand alkali bees were shipped in these blocks to Ray Colby ranch on Columbia Basin project. Shipment is part of experiment to increase alfalfa seed yield. —Photo courtesy FARM MANAGEMENT MAGAZINE.

up to five hours a day and trip around 1000 blossoms . . . and all for free to the lucky grower who has a few dozen nests of the alkali bee near his alfalfa field.

Whatever the outcome of this experiment, it is extremely important for beemen engaged in pollination to keep abreast of all new developments and plan their future expansion and operations accordingly. Who knows, maybe many western beekeepers will in the future operate their honey bees for honey alone during part of the year and spend the extra time locating alkali bees near alfalfa fields—on a contract rental basis. You probably wouldn't even need to use your two-ton truck for the job. A passenger car would do fine.

How to Remove Granulated Honey from Combs

by A. H. MACCARTER, Springfield, Massachusetts

UNCAP THE HONEY with a sharp knife. Put an empty hive body on a strong colony of bees over an **inner cover with the bee-escape hole open.** Place two of the uncapped frames of honey on each side of the hive body.

Fill both sides of an empty extracted comb with water by holding it under a faucet. Place it in the center of the hive body where you have put the frames of granulated honey. Sprinkle the two frames of honey with a little water when you put them in the hive.

Do this sprinkling two or three times a week and the bees will move the honey and it will become liquefied. This can be done when it gets warm enough to add supers to your bees.

Another method would be to wait until warm weather comes and then put a hive body of the granulated honey on top of a strong colony of bees with a super of foundation between the brood chamber and the frames of granulated honey. The bees would use some of the honey to draw out the foundation and the heat from the sun and from the colony of bees in the brood chamber would liquefy the rest of it. Always keep the granulated honey on the top of the colony no matter how many other supers you may add during the season.

Simplified weight control

by PORTER H. EVANS,
Morristown, New Jersey

WHEN MRS. EVANS and I started beekeeping in 1946, we didn't know the difference between a worker and a drone, and we had never seen a queen. When we looked into our first hive, we didn't know which was brood and which was capped honey. Eggs, larva, and nectar were new terms to us.

After clearing this hurdle of identification, we found it was followed by other and more difficult ones. For us one of the hardest problems to solve was to find a satisfactory method of recording the progress of the various hives. Without accurate information it is impossible to arrive at the correct answers to so many of the questions that arise: Which is the best hive? Which is the best queen? Which are the best honey-producing flowers? Which is the best season for honey production? When should a colony be fed? Do the bees have plenty of room? Which hives require additional supers? Etc.

We tried, at first, to keep a record of the number of frames of eggs, larvae, brood, pollen, nectar, and honey in each hive. When we had only one or two hives, it wasn't too difficult to keep these records, but we found the accuracy of the results left a great deal to be desired as it was never clear which frames were full enough to count. As we increased the number of hives, and our questions became more complex, we realized we must have a better method of measuring results.

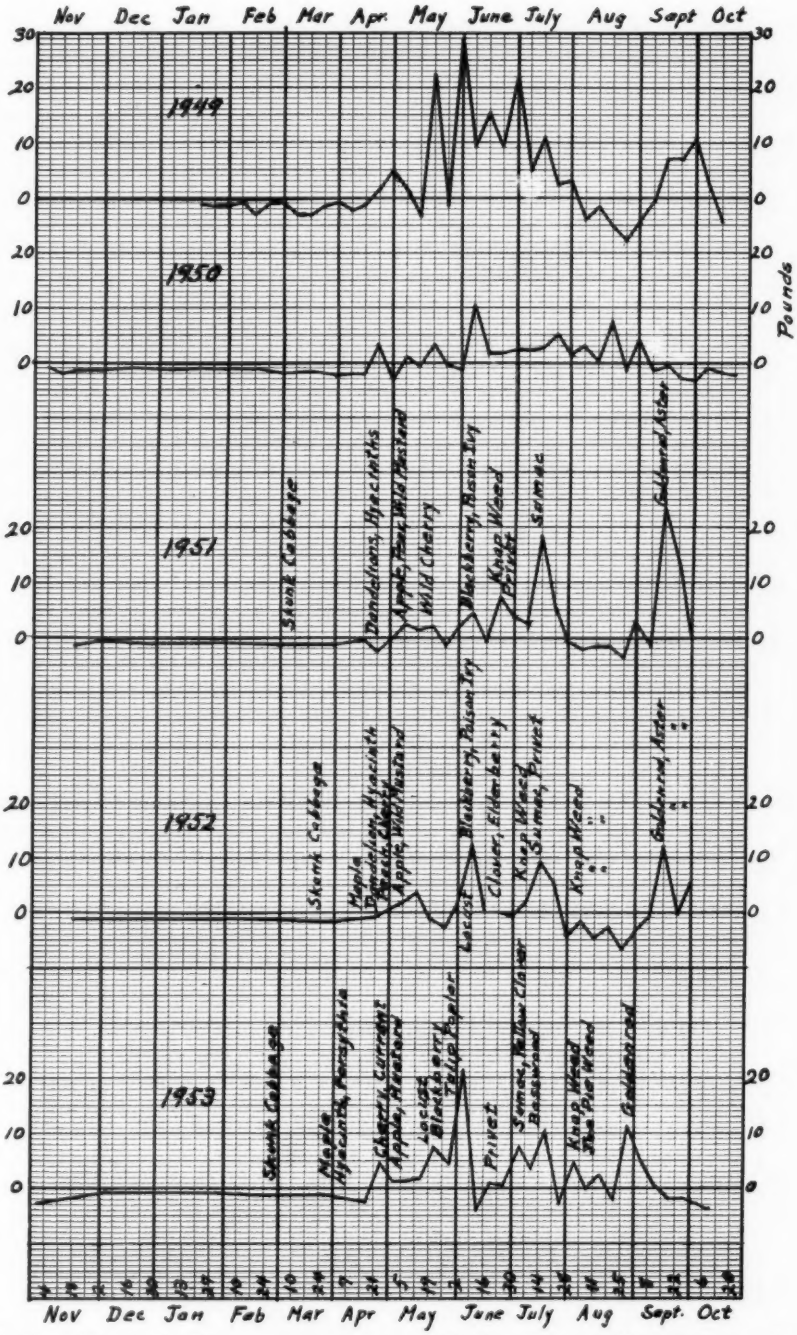
Weighing a hive.

It seemed to me the ideal data to have would be the weights of the hives. These would be easy to record and would give an excellent and exact means of comparing hives. It could be plotted to show visually the progress of the hive with time.

But the question was how to obtain this information easily, quickly, and cheaply. Obviously we did not want to lift the hives on to and off of platform scales every time we wanted to know their weight. Besides, platform scales are too expensive.

I got the 200-pound scales shown in the picture for $3.61. The rest of the material needed to make the first model was found around the place. Its design and construction were fun, and the results were all that we had hoped for.

We originally designed the scales to pick up and weigh four-story hives which rarely exceed 200 pounds gross weight. During the first two years no hive exceeded four stories as there was always a super ready to remove before a new one was needed. But the third year this was not true, and I had to add stilts to the tripod. It may be necessary to change the location of the scales in the pulley system so that hives up to 400 pounds gross can be



weighed without having to remove supers and weigh them separately.

After a satisfactory method of weighing the beehives had been developed, the next problem was to determine from the hive weight the amount of honey in it.

First we set up a table of weights

for the components of the hive. From this we can compute a tare weight for the wood and comb of any hive no matter how constructed. We can compute the change in tare whenever there is a change in the number of supers or in any other part of the assembly. Then we deduct the fixed tare from the gross weight and record only the balance or net weight.

There is, however, no easy way to separate the weight of honey from the weight of the bees, pollen, brood, larvae, and eggs since they vary with the season. But from hive to hive and from year to year they maintain very nearly a fixed ratio to each other. Strong hives with lots of bees, pollen, and brood make lots of honey; weak hives make proportionately less. In our studies, therefore, we decided not to try to separate these two variables.

We started weighing our hives on January 16, 1949, and during the first year we weighed every hive once a week. During the winter months we get information on the status of the hive and the time when brood rearing starts in each hive without having to open it, breaking up the cluster and exposing the bees and brood to the cold. All we want to know is obtained easily and quickly regardless of the weather.

After learning the rate at which food is consumed during the dormant months and the rate at which consumption increases with brood rearing, we reduced our weighing during the winter to once every month or two. But during the honey flow the results are so exciting and unpredictable that we continue to weigh every hive every week. It is instructive to study the changes from week to week and to compare progress with previous years.

Each week we prepare two tables similar to those given herewith for the week ending July 12, 1952. In one, the hives are arranged according to their weekly gains and losses, and in the other they are arranged according to their net weights.

Table I should be watched very closely as it is the most sensitive to any change in conditions within the hive. When all the hives are running smoothly, there will be little, if any, change in the relative position of the hives in the table. The strong hives will have the biggest weekly gains or losses and the weak ones the least. Any big drop in position suggests trouble within and indicates that immediate inspection is required. It will probably be found that the bees are preparing to swarm. If no action is taken because of weather conditions or any other reasons, and the hive swarms, then that hive will be at the bottom of the table the next week with a loss of five to fifteen pounds.

Table II is a summary of all the previous gains and losses and gives the status for the year thus far. If the hive hasn't swarmed or been queenless, the standing indicates which are the good queens and which are the poor ones. The good queens should be used for breeding, and the poor ones replaced.

The low weights at the bottom of Table I are the result of poor beekeeping during April and May. We have

(Continued on page 446)

Table I

WEEKLY GAIN OR LOSS

Hive No.	Gain July 5-12
7	22
4	21
1	18
11	16
6	10
12	7
5	4
9	3
10	3
8	3
3	2
2	2

Table II

PRODUCTION STATUS

Hive No.	Net Weight
4	107
11	94
6	85
1	82
12	70
7	70
9	68
5	64
10	55
2	48
3	43
8	38

Live and Learn

By Propolis Pete

FOR THE THIRD year in a row, after the bees built up their brood to a point of great strength, the weather turned cold and wet and the bees had to stay home. They are still strong, and the honey flow has started, but it looks now as though the medium colonies at unpacking time are going to be the ones that put up the most honey.

Sometimes I wonder what can be done about it. Whenever the subject comes up, the consensus of opinion seems to be to get the colonies as strong as can be, even to the extent of putting in a couple of queens to build up in time. Some beekeepers have put a lot of thought and energy into the invention of hive heaters to give the bees a boost very early in the season. Maybe I am all wet, but the way my bees operate, these big colonies are more of a headache than a help. I haven't any records to prove it, but if my memory is correct, this same thing happens every year. The nice comfortable colonies that are easy to handle, and grow slowly but surely, and just keep on going up as you add supers, are the ones that put honey into the cans at extracting time. It's hard work tearing down those giants at swarming time, and a lot of wasted time on the weaklings.

Speaking of swarming time, this looks like a good year for it so far. My equipment is all full, so I am not interested in gathering stray swarms, but by golly I have seen some corkers that I have been tempted to bring home with me. One in particular gave me a thrill. Since people found out that I have bees, I get a call whenever a swarm hangs in a place where it isn't wanted. On this one, I gave the name of a beekeeper who wanted swarms, and then hopped in the car to go and see the fun. Friend beekeeper was there ahead of me, although I don't know how he did it, and asked my professional advice. This swarm was hanging on the lower branches of a wisteria vine, and was so far in that you couldn't do much with them. So we took the frames out of a hive, shoved the hive in under the cluster, and I just gave the branch a sharp rap. The whole cluster went plop into the hive, we slapped in the frames, put on the cover, and the swarm was hived. Elapsed time, 45 seconds.

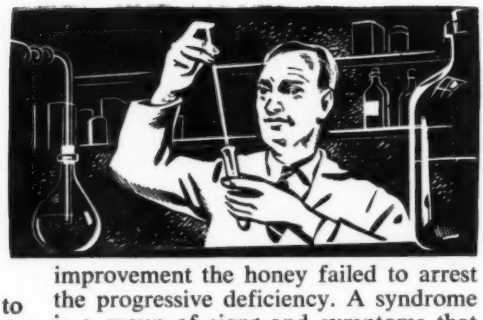
Another funny swarm was found hanging about seven feet over my own colonies. I was working near the line of hives all day and didn't see or hear a swarm come out. None of my hives showed indications that it had swarmed, although three of them had been demareed because they showed cells. I had company that day, and as usual the company wanted to see the bees. I had just finished bragging that I had swarming pretty well licked, when my friend asked what that funny looking lump was on the cherry tree. It don't seem possible that they could have come out without my knowing it, and if it came in from some place else it would have made such a racket that I would have known it. The only explanation I can think of is that it did come in from the outside, and had been hanging there for a couple of days before I saw it. The limb on which they were clustered had quite a bit of wax stuck to it, which is a sign that they had been there for some time. Regardless, another beekeeper friend of mine is one colony richer.

While I don't want my colonies to swarm, I do get a big kick out of new swarms and package bees. Guess I am a born builder-upper, because I get a bigger kick out of making something work than watching it run after it is started. Next fall, instead of fixing my colonies so that they all will come through the winter in spite of the rules and regulations, I am going to unite the smaller so that I have some empty stands and equipment. Then I can play with these little gold mines that people are continually thrusting upon me. And who can tell, maybe I'll find that I'll get more with less.

There is an old Pennsylvania Dutch saying that recently has been made into a song, to the effect that "We get too soon oldt, and too late schmart". Maybe that applies to me too, but anyway it is fun, isn't it?

Bee Facts

(A Digest of Scientific Research)



Pollen Factory

A POLLEN FACTORY, believed to be the first of its kind in the world, has been opened at Vegaholm near Halsingborg, in the southernmost Swedish province of Skane. Annual production of five tons of pollen has been made into vaccines for treating allergies.

It is expected that the output of pollen will be between 1,300 and 1,735 pounds of inexpensive extracts, such as now sell in the United States for $3.50 per gram.

Since pollen is high in nutritional value it is expected to be important in the food field. Pollen contains 30 to 40 per cent albumin and is also rich in amino acids.

The methods used in collecting pollen from clover, rapeseed, and other plants, as well as for its refining and storing are secret. They were developed in nine years of research by Gosta Carlsson, a former railway employee at Vegaholm, whose hobby is beekeeping.

Reference: North Western Druggist, Vol. 62, p. 48. May 1954.

Comb Honey Aids Nutrition

GUINEA PIGS showing wrist stiffness, induced by lack of the anti-stiffness factor in the diet, were given honey daily. Honey which had not been heated commercially and wax from honey comb were effective in relieving wrist stiffness.

Moderate cases of stiffness were cured with daily doses of 500 mg. of honey or wax within a week. More severe cases of wrist stiffness were improved within the week's trial.

Unheated honey was given to a guinea pig in a very advanced stage of the deficiency syndrome with stiff wrists and elbows and intradermal calcium lumps. After some initial improvement the honey failed to arrest the progressive deficiency. A syndrome is a group of signs and symptoms that occur together and characterize a disease.

An attempt was made to prevent the development of the deficiency syndrome by adding honey when 12 guinea pigs were started on the deficient diet. At the end of 3.5 months, one animal receiving daily doses of 3 gm. of unheated honey showed a slight stiffness in one paw; others in this group were free from stiffness.

Animals on the skim milk diet plus added known vitamin requirements and honey which had been boiled 30 minutes were slightly to severely stiff. And a group of four guinea pigs, on the deficient diet and receiving 3cc. of molasses daily, included two animals free from stiffness and two which were moderately stiff. The latter two failed to improve when changed to unheated honey.

After 3.5 months the heated and unheated honey groups were reserved. In another month and a half, animals in the group finally receiving unheated honey were free from stiffness and those in the group changed to heated honey had moderate to severe wrist stiffness.

Reference: Church, Julia. Honey as a Source of the Anti-stiffness Factor. Amer. Physiological Society Federation Proc. 13:26. March 1954.

Queens from Laying Workers

IN A NUMBER OF apiaries in South Africa laying worker bees were found to lay fertile eggs that developed into normal queens. Laying worker bees would invade normal colonies, weak or strong, and if successful proceeded to lay eggs alongside of the queen.

Several queens were reared from larvae taken from the nuclei contain-

ing laying workers. Three of these queens were allowed to head good strong colonies in two standard ten-frame Langstroth brood chambers, and were in every way normal queens.

The workers that actually lay the eggs are easily distinguished by their larger abdomens, and the characteristic attention which the other worker bees give to them. This attention is similar to the behavior of worker bees to a normal queen. By marking these enlarged laying workers each time they inserted their abdomen into a cell to lay, it was found that several may be active in the same nucleus. Some of these workers were caught in the act of laying with the egg protruding from the abdomen.

The egg laying of these worker bees is very irregular; at first some 15 to 25 eggs may be laid in one cell, but later the egg laying becomes more regular with fewer eggs to a cell. One characteristic of the brood from these laying workers is the great variation in age of the larvae within a small area of comb, presumably due to the great competition for life of the larvae within each cell. Another peculiarity is the presence of comparatively large areas of brood on the two outside frames of a brood nest, though in a normal colony or nucleus consisting of the same number of bees no brood at all would be reared on these outside combs.

Reference: Lundie, A. E. Laying Worker Bees Produce Worker Bees. South African Bee Journal. Vol. 28, No. 1. Pg. 10. March/April 1954.

Adventures of Tyl Uilenspiegel

by JAN K. VERMAAS, OSS, Holland

TYL UILENSPIEGEL, a farm hand and fabled joker who lived in the 14th century, was known throughout Belgium, Holland, and Germany for his numerous tricks. As far back as the 15th century there were books published about the adventures of Tyl. Today he lies buried in Molln near Lauenburg, Germany.

One of Uilenspiegel's adventures involves honey bees and for that reason is presented here.

One evening when Tyl was walking through a field he was overtaken by a thunder-storm. He immediately started to look around for a shelter. There was nothing available but a row of skeps. In desperation Tyl climbed into an empty one.

Tyl had bad luck. Two robbers came into the apiary intending to steal a skep. Of course they were after the heaviest one and that was Tyl's. The skep was placed on a carrier and the robbers proceeded to carry it away.

What would be the fate of Tyl when the robbers would discover their error?

It was very dark as the skep was carried away and Tyl took advantage of this situation. He tugged at the clothing and hair of each of the robber's clothing, and soon there was a murderous fight between them. In the confusion Tyl escaped.

In Holland we are still acquainted with skeps, therefore, to this writer it has always been a riddle how Tyl could have sought shelter in a skep. Perhaps the drawings, designed by a Belgian and a Dutch artist, will help you solve the riddle.

Let's talk about honey plants

by HARVEY B. LOVELL, Louisville, Ky.

[Feeling the need for more material on honey plants, we are here introducing this new monthly column, "Let's Talk About Honey Plants" by Harvey B. Lovell. Dr. Lovell, son of the late John H. Lovell, author of "Honey Plants of North America", is an experienced botanist and beekeeper who is continually traveling about the country in search of new honey plants. Readers who are interested in honey plants are invited to send their experiences and comments to H. B. Lovell, c/o Gleanings in Bee Culture, Medina, Ohio.—Editor.]

I HAVE BEEN to Florida some five times but this spring is the first time that I have had the pleasure of observing orange groves in bloom. It is a beautiful sight. One knows that he is approaching the vicinity of an orange grove by the strong sweet odors of the bloom, even before he sees the flowers.

The nectar is secreted so fast by the flowers that it can be seen with the unaided eye. It is no wonder that the bee stores so much surplus from oranges and other citrus fruits. The nectar from grapefruit, lemons, limes, and other members of this group is all collected together and sold as orange honey. Pure orange honey is white in color with a fine, distinctive flavor.

Northern people who have been brought up on clover honey, often find the flavor of orange honey so different that they do not care for it at first. However, I find that most people soon come to like it as much as any of the more common kinds. An open jar of fresh orange honey gives off a delicate aroma of the flowers which soon permeates a room.

Florida beekeepers do a fine job of marketing this honey. Almost every fruit stand in the state features the honey along with citrus fruits. Honey is packed in jars of various shapes and sizes, some even having the shape of an orange. Most of the honey is extracted, but some beekeepers who have their own stands feature chunk orange honey, too.

Black locust **(Robinia Pseudo-Acacia)** has at best one of the shortest blooming seasons of any of the important spring honey plants. This spring we had a very warm April in the south-central states and bees built up in fine condition to store a surplus. When locust trees burst into bloom the last few days in April, the bees started to work the flowers promptly. Then came several days of cold, rainy weather, so cold in fact that the first ten days of May set new records for the weather bureau. There were several nights of frost as far south as Tennessee. As a result, the flow was stopped almost before it got started. Before the weather warmed up most of the flowers had dropped from the trees. James Dierken, Louisville, reported that his bees were able to work on the bloom only a single day.

Grapefruit blossom

In a recent letter C. Kenneth Smith of Marked Tree, Arkansas, gives the honey from peppervine **(Ampelopsis arborea** formerly **Cissus arborea)** a very low rating. He says the honey is so dark that it ruins his vetch honey if he does not get the latter off in time. Also if the season is wet the peppervine honey is liable to ferment and blow the cappings. It blooms with him from the middle of June until the first of August, and darkens all the summer honey flows.

Another important vine in the south-central states is the buckwheat vine or ear-drop vine **(Brunnichia cirrhosa).** Although Marked Tree, Arkansas, is near the northern limit of its range Mr. Smith considers the honey "bottle grade" if he can get it pure enough, but he estimates that ten per cent peppervine honey will darken it too much to retail as table honey.

ON A RECENT trip through Mississippi, Louisiana, and Arkansas, I found a strange vine climbing over the shrubs and low trees which was being eagerly visited by bees. The flowers looked very much like those of the spreading dogbane which is a good honey plant in some of the northeastern states.

As I had never heard of a species of dogbane that climbed trees, I checked my botanical manuals and sure enough, there it was: climbing dogbane **(Trachelospermum difforme).** Its range is chiefly along the coast from Delaware to Texas and up the Mississippi Valley to southwestern Indiana and southern Missouri. The yellow flowers are very fragrant.

Deams, in his "Flora of Indiana", writes that "The first specimen I ever found was detected by its odor. I noted a peculiar pungent fragrance and in searching for the source I found this vine, at least a rod distant."

I first studied this interesting honey plant on the farm of Earl Drane in northern Louisiana. After spending the evening with him discussing local honey plants and religion, I declined his cordial invitation to spend the night in his home and pitched my pup tent in a place suggested by him in the pasture back of his house.

As I slipped into the tent and zipped up the mosquito netting, I noted a number of cattle feeding in the other end of the pasture. Sometime in the night, I awoke to find a bull with his head against the mosquito netting, breathing heavily only six inches from my face—it sounded to my startled ear like snorting. My tent was so tightly closed that the only way out was under the bull's head and between his feet—so I decided to stay put and await developments. To complicate matters a cow came up on the other side and tried to graze under the tent.

After what seemed hours, the bull, which was really only two-thirds grown, decided to seek greener pastures and wandered off. I quickly crawled out and shooed away the cow which was then chewing on my tent ropes. After noting that the herd of cattle was steadily feeding in the opposite direction as if they were no longer interested in their new tenant, I slipped back into the tent and slept soundly until morning.

A Young Beekeeper in the Making

Little Martin enjoys watching the traffic at the entrance of the hive.
—Photo from T. Cricis, Hungary

From the Field of Experience

A Beginner's Tale

by GLEN GRAHAM, Los Gatos, California

THIS IS a beginner's story outlining what can happen to the newcomer in beekeeping if he does not (1) begin with standard equipment; (2) look into the hive frequently . . . . and, (3) keep his colonies headed with a young queen and disease free.

I am 17 years old and I started keeping bees three years ago. At least that is what I called it at the time.

I built a hive and frames in the wood shop at school in the eighth grade (using my own dimensions which was my first mistake).

During my Freshman year, a colony of bees in the high school building cast a swarm. The agriculture teacher put them into a paste board box and gave them to me when I asked him about them a couple of days later. My father and I put them in my hive that night. We put in two frames with one-quarter sheet of foundation each (another mistake). During the following two weeks I put the rest of my six frames with similar amounts of foundation or none at all. This resulted in combs running in any direction according to the bees' fancy.

The following year they didn't receive any attention from me. There were no swarms issued that I know of. This might be attributed to the fact of the enormous size of the hive (24" long by 16" wide by 12" deep).

The next year I had a very populous hive of bees, but this didn't last long. Soon a very large swarm issued, the hive being too crowded, I presumed. All attempts to hive these bees were hindered by the fact that they clustered on a tangle of boysenberry bushes, my lack of experience, and besides it was a nice summer day and I was busy doing other things. So I decided to give the ones left in the hive more room in the form of a half-depth super (this time a standard size). After this swarm issued it seemed like the hive was never crowded with bees like before.

This hive wintered all right, but the next spring there seemed to be an excessive number of dead bees on the alighting board all the time. I would clean them off and the next day or two they would be just as thick as ever. So I started feeding sulfa, which helped a lot. But when I stopped feeding sulfa this condition returned.

Last winter the hive went through all right, but the same condition of dead bees came with warmer weather.

I was away July and August of '53 and when I returned the colony had died out. There wasn't any honey left in the hive, and I think the ants probably carried it off if there was any.

Even though I lost the bees I have gained a tremendous amount of knowledge and this spring I plan to use standard equipment, healthy bees, and look into the hive often enough to know what is going on. I am convinced that this is the only way to determine what a colony of bees needs.

Plenty of Room for Argument

by ROBERT M. MEAD, White River Junction, Vermont

In reply to Carl Killion

ONE OF THE things that makes beekeeping interesting is that it is not an exact science. I have often said that we would work on bees all day and argue about bees all night, and many times that was nearly true. How do you introduce a queen? What is a strong colony? Are excluders necessary? Will sulfa cure AFB? Well, any of these questions and a dozen more will start an argument and sometimes the argument gets quite heated.

Now in the May issue of Gleanings I had an article about comb honey and in the June issue Carl Killion sort of jumps all over me. My methods, says Mr. Killion in effect, are enough to make a real comb honey man shudder. Actually I am not too surprised

at that reaction. Mr. Killion is the outstanding comb honey producer of the generation and probably produces a hundred combs, or more, to my one. Moreover he has worked out a highly successful procedure for the production of comb honey.

Just the same I am inclined to argue. There was nothing in my article but what we have done successfully and that others can do successfully. I wrote the article especially for the average beekeeper and not for the perfectionist. What I tried to point out was methods whereby the average beekeeper could produce some comb honey and thus broaden his market and produce it without all the complicated manipulations and black magic that the perfectionists insist go with comb-honey production. I am willing to admit Mr. Killion's superiority as a beekeeper any day but I just cannot accept his conclusions.

Mr. Killion bears down heavily on the quality angle. It's a good point but I fail to see where a good clean well-filled section of good-flavored honey produced by one method is not just as edible and marketable as one produced by the other. The method I suggested certainly requires strong colonies, a good honey flow, and considerable judgment in giving supers but isn't that true anyway, anywhere, anytime, and with any method. As to winding up with some unfilled sections that's a possible penalty of comb-honey production that no one can escape. We may have a good flow on today and none tomorrow, that's something that the fates hand us and not a fault of procedure.

Mr. Killion hands a considerable slap at the two-story hive. I have been recommending it to beginners and old timers alike in my territory for the past ten years and shall continue to do so because it is the most useful combination I can think of. It provides room for early season brood rearing. It provides food, in normal seasons, for both winter and spring without the nuisance of feeding. In actual practice it gives good big colonies of bees instead of good small colonies (as in one-story hives). It seems hard to believe that a man could try two-story hives and then discard them.

As to producing comb honey over them I can give a good sample. Yesterday, June 3, we visited some two-story colonies that had been given three shallow extracting supers just before the fruit and dandelion flow. Now the best of these are full of bees and there is considerable honey in the supers. When the clover flow starts in ten days we can lift up the top super, slip in one or two comb honey supers, and if we have any flow at all they will be nicely filled. Admittedly these are our very best colonies; admittedly it may not be the best method to produce comb honey, but, it does give us some good comb and with fairly painless procedure (low labor cost). As to quality I am not going to worry until customers complain. So far they don't.

Where Mr. Killion really has me baffled is where he attacks my suggested method of swarm control. He says it won't work but of course we use it because we do think it works. If Mr. Killion will write an article on swarm control I am sure it will get read with intense interest in this part of the country.

Last Call for European Beekeeping Tour. This is your last chance to join the beekeeping tour to Europe, to include attendance at the International Beekeeping

These are some of the highlights of the tour, which sails from New York on the Liberte, on August 11th: Visits to Brother Adam's famed apiary at Buckfast Abbey, Rothamsted Experiment Station. Then you'll see the majestic scenery of Norway, interesting Sweden, and spend almost a week in Copenhagen. The group will go to visit the German Beekeeping Research Institute in Celle before visiting the Netherlands, Belgium, and Luxembourg.

So come and join the group! You'll have a wonderful time. Further information may be obtained from Mrs. W. A. Stephen, Box 92, Cary, N. C., or c/o the Patterson Travel Service, 208 West Morgan St., Raleigh, N. C.

FROM Foreign LANDS

Colony Warmth

REGARDLESS OF THE season, the bee controls the temperature of her hive by raising or lowering it as conditions may require. So reports Par Pierre Lavie of the Station de Recherches Apicoles, Bures-sur-Yvette, France.

Among social insects, the Frenchman points out, the honey bee is the one whose nest keeps more or less of an even temperature. Other results of this investigation show that

(1) the temperature of the winter cluster depends directly on the outside temperature, and

(2) there are "cold colonies" and "warm colonies", and their respective changes in temperature have no relation with the strength of the bee cluster nor the provisions of the hive.

Insectes Sociaux. January 1954.

Controlling Wasps

TROUBLESOME WASP nests can be destroyed with nitrous oxide, which is commonly known as laughing gas. It is reported to be safer to use than cyanide, and if properly used there is no need for a bee veil. So says D. M. Jesper in the BRITISH BEE JOURNAL.

"All the apparatus required is an ordinary smoker, about two ounces of ammonium nitrate crystals and a small roll of corrugated cardboard. The time for the operation is at dusk, when the wasps have finished flying for the day and all except a few stragglers which, like bees, may remain outside all night, are inside the nest.

"The procedure is quite simple: load the smoker with the corrugated cardboard, light in the usual way, and put the ammonium nitrate crystals on top of it. Puff the smoke until a dense cloud of white smoke appears, when no more puffing will be needed, and the crystals are burning. Apply the nozzle of the smoker to the nest hole and hold it there, belching smoke into the nest until it goes out, which takes only a few minutes. The nest can be dug up immediately or left with a heap of earth over the entrance hole to keep the gas in until the next morning."

British Bee Journal. April 1, 1954.

Preparing Honey for Exhibition

THE TIME TO begin preparing honey for show is not when the entries close, nor even when the entries are put in, but when the particular honey known to be good enough to exhibit has been gathered by the bees and capped over. Only new combs with every cell capped over should be selected from the hive or hives for extracting for exhibition.

Absolute cleanliness in extracting is essential, the extractor being clean with a clean can to receive the honey. Carefully wipe the hot uncapping knife before using it. Extracting should, of course, be carried out where there is no dust and the weather should be dry. The honey should be strained into a clean can and sealed up until a short time before the entry has to be forwarded to the show.

Honey should be allowed to settle in the can as long as possible. The jars can be filled directly from the can by punching a neat round hole near the bottom of the tin and making a clean round plug ready to plug the hole.

In filling the jars, which of course must be the type and size stipulated in the schedule, absolutely clean and dry, and slightly warmed in an oven, the honey should be allowed to flow gently down the side by tilting the jar slightly. The jars should be filled to within half an inch of the top and the lids immediately screwed on. Only new jars, wads, and screw caps should be used.

The Australasian Beekeeper. Mar. 15, 1954.

SLUMGUM AND ITS RELATION to AFB

(Continued from page 407)

then fed by gravity feeders to two normal colonies of bees.

Samples of the slumgum were placed on inner covers, inside of hive bodies over two other normal colonies with the bees having access to the slumgum through the opening in each cover. The colonies were examined at intervals over a period of eight weeks for the first sample and four weeks for the second. No evidence of disease was observed in either case.

The colonies have been put back into production but are marked for continued observation during the remainder of the season. Since symptoms of AFB usually become visibly established within ten days after a colony is infected, it can be assumed that the four colonies involved were not contaminated by this exposure.

In years past the author has seen piles of slumgum outside of commercial wax rendering plants, available to many colonies in the near vicinity. The commercial plants also operated several hundred colonies for honey production and for rearing queens. It is certain that they would not have exposed the slumgum to their bees if it was a source of AFB. In one case in particular, tons of slumgum had accumulated over a period of years within 200 yards of the home apiary.

Dr. W. E. Burnside, as well as several others, investigated the resistance of **Bacillus larvae** spores to heat and came to the following conclusions: "It was found that spores sometimes grew in cultures after they had been heated in an autoclave for 40 minutes at 15 pounds pressure. On the other hand, spores that had been boiled for relatively short periods and remained capable of growing in culture did not produce American foulbrood when inoculated into colonies of bees."

In 1945, Burnside inoculated 62 colonies of bees with 500 billion boiled spores in a liter of 50 per cent honey solution and sugar syrup. Six of the colonies received spores boiled five minutes, eight colonies spores boiled ten minutes, 16 colonies spores boiled 15 minutes, 12 colonies spores boiled 30 minutes, and four colonies spores boiled for each of the following periods: one, two, three, four, and five hours.

"Colonies were inspected for American foulbrood at weekly intervals as long as weather conditions permitted during the year that they were inoculated. Thereafter they were inspected about once a month during the bees' active season. All the inoculated colonies remained free from active American foulbrood during the entire time they were under observation."

Suggested Disposal

While it seems apparent that slumgum from properly processed combs has little likelihood of being a source of AFB infection of colonies, it would be completely safe to cover the slumgum with soil as is done in many city dumps. The slumgum could also be spread over garden soil and either plowed or disced under for its fertilizing and soil-lightening qualities.

In home-operated wax-rendering plants, it would be entirely safe to plow the slumgum under or cover it with soil instead of exposing it to bees in the open.

Where it can be burned, without adding to the smog problem, burning would eliminate all possibility of being a source of infection.

The disposition and handling of the frames from which infected combs are melted has been the subject of varied opinions. Most beekeepers find it desirable to boil the frames in lye water sufficiently to remove the propolis and portions of old comb. The frames are then dipped in boiling water to free them from traces of the lye.

This process cleans the frames and dissolves any honey that might carry any of the spores, and puts the frames in condition to be reserviced. The time the frames are emersed in the boiling water or in boiling lye solution need not be more than 10 to 15 minutes. A stream of live steam or very hot water can be used to clean the tops, bottoms, and hive bodies of any honey they might contain. A good cleaning with a scrub brush and with a hive tool would then put the tops, bottoms, and hive bodies in condition for reuse.

A Talk to Beekeepers

With Special Attention to Beginners

M. J. Deyell

IT HAS BEEN SAID that it takes all kinds of experiences to make a life. It might be said also that it takes all kinds of experiences to make a beekeeper. No two seasons are exactly alike. One thing that makes beekeeping so interesting is that we never know just what the future holds for us. Usually the things we think will happen, do not happen, and the things we think will not happen, do happen.

Feeding Sugar in the Rain

A year ago this spring the bees stored a considerable amount of honey from fruit bloom and dandelion, enough to tide them over until the summer honey flow began. This spring we had one or two warm days during fruit bloom when the bees made some gains. The remaining days were cold and rainy. Brood rearing was well under way, in fact, ahead of normal during early April in this latitude, this being due, in part at least, to the mild winter which caused considerable activity in the hives.

Colonies that had an adequate amount of honey last fall consumed a large portion of it during early spring, as they could not go out after nectar because of bad weather.

During the latter part of May in this area we had a very cold spell and this naturally aggravated the situation. Occasionally there would be a day when bees would collect a little nectar and pollen. However, the bees seemed to collect a considerable amount of pollen, even though they did not get much nectar. This enabled them to continue brood rearing as long as the stores remained in the hive.

The last few weeks in May and the first few days in June we were feeding sugar. One cold, rainy night I put on a pair of high rubber boots and a rain coat and tramped through the wet grass to my apiaries in order to feed sugar by pouring about three pounds in each inner cover with center block removed. The bees took the sugar quite readily.

I ran onto a method of supplying moisture to the granulated sugar. This

Jack Deyell

consists of pouring a little water over the sugar, using a garden sprinkling can. The bees seem to take the sugar much quicker than they will if it is not moistened. If some of you readers try this let me know how it works for you. I do think feeding sugar syrup or combs of honey is more satisfactory but dry sugar can be fed as an emergency measure.

A Honey Flow Sometimes Creeps Up on Us

This is June 10th and the temperature is up to almost 90 degrees. Quite an amount of white Dutch and alsike clover is in bloom, but bees are not getting much nectar. Our scale hive has gained six pounds in three days. That is rather encouraging, at least we do not have to feed sugar. [Since writing the foregoing I'm glad to report that the scale hive gained five and one-half pounds on June 10.]

We have had some good rains in this area. Did you ever lie awake at night listening to the rain pattering on the roof, knowing that it would increase the possibilities of a honey flow? I have, more than once. In fact, it has been difficult at times for me to drop off to sleep.

Most of us will have to admit that we know comparatively little about nectar secretion. We should know

more. We do know, however, that at times when weather and soil conditions are just right, nectar pours in.

It seems that white dutch and alsike clover have to reach a certain stage of development before the plants begin to secrete nectar copiously. It may have been the late Dr. Miller, who observed that some of the florets or corolla tubes have to wither before nectar begins to come in. I can recall the season of 1929 when there was an abundance of alsike clover in bloom the first week in June, but the bees were not visiting the blossoms, or if they were, they didn't get any nectar. In fact, some colonies were on the verge of starvation. We wondered if the honey flow would ever begin. It did begin in earnest, June 11th about 3:00 in the afternoon, and how the nectar did pour in.

We were kept busy putting on supers in our 20 apiaries consisting of around 1000 colonies we operated at that time. The flow increased in its intensity as the season advanced. We soon ran out of supers containing drawn combs and then put on supers containing frames with full sheets of foundation. Instead of lifting off the filled and partly-filled supers in order to put the fresh supers at the bottom of the pile, we simply put the empty supers on top. It was then we learned that during a good heavy honey flow top supering will work.

And so, we have found that a good honey flow occasionally creeps up on us. We hope this may be true this coming season but we will know better a little later on, as to what happens.

It is amazing what populous colonies will do in putting up a big crop of honey during a heavy flow. It pays to have an ample amount of extracting supers with drawn combs on in time to take full advantage of the flow when it comes. If all supers are not needed, they may be removed later on. These supers of drawn combs are better on the hives than sitting in the apiary house being riddled with moths.

Don't Take Honey off until It is Ripened

SOME BEEKEEPERS make the mistake of removing partially capped-over combs from hives in their eagerness to extract some early-gathered honey. Such honey may contain a high percentage of moisture and is likely to ferment after being extracted and put into containers. Combs should be at least three-quarters capped over and section comb honey should not be taken off the hives until all of the sections are capped over. However, at the close of a flow, comb honey producers are likely to have a few partially capped sections.

Be Sure Extracting Room is Bee Tight

The work of extracting honey is usually done at the close of a honey flow when nectar is not plentiful and bees are likely to rob on the slightest provocation. This makes it imperative that the room or building in which honey is extracted should be made absolutely bee tight. If bees gain an entrance, they are likely to make considerable trouble, even after the small hole or opening through which they gain entrance to the building is plugged shut.

Beekeepers should be especially careful when manipulating hives after the major honey flow, to close the hives up as soon as possible and to avoid leaving combs of honey standing against the hives for any length of time, for this invites robbing.

Equipment for Extracting Honey

A small two or three frame extractor is large enough for a beekeeper with from one to 25 colonies. A small motor attachment saves much labor of turning the crank by hand.

Combs of approximately the same weight should be selected so that the machine may not be thrown out of balance. After combs are uncapped with a hot knife they are placed in the baskets of the extractor. A part of the honey should be thrown out of one side of the combs which requires only a few revolutions, then the combs are reversed and all of the honey is thrown out of the opposite sides. The combs should then be reversed again and all of the honey thrown out of the first sides. This avoids placing too much strain on the midrib of the comb and results in a minimum of breakage.

How to Strain Honey

The small beekeeper with a hand machine may run the honey from the extractor into a pail, then empty the

honey into a small honey tank covered with two thicknesses of fine cheese cloth for straining the honey. During hot weather honey from the extractor will strain readily but during cool weather it may be necessary to heat the honey before straining.

Michigan Experiences

Chapter 7

Robbing Honey Out of Single-Story Brood Chambers

In recent talks, I have mentioned different kinds of robbing. The term "robbing the bees" has been quite prevalent during the years. It has reference, of course, to removing what is calculated to be surplus honey from colonies of bees, the assumption being that there is a sufficient amount of honey left for the food requirements of each colony during the winter and early spring months.

The first year we were in Michigan, one of our objectives was to produce a certain amount of honey. During August, when we had practically finished extracting the white honey, we realized that we were not going to attain our goal in honey production, so we resorted to taking some full combs of honey from the sides of each brood chamber, replacing these combs with empty drawn combs. This was a very foolish thing to do, as we discovered later on and especially the following spring.

If there had been a heavy honey flow from goldenrod and aster during September and early October, as there is in the vicinity of Medina, we might have been justified in removing a few combs from each brood chamber. We did have a goldenrod honey flow but not sufficiently heavy to secure surplus honey.

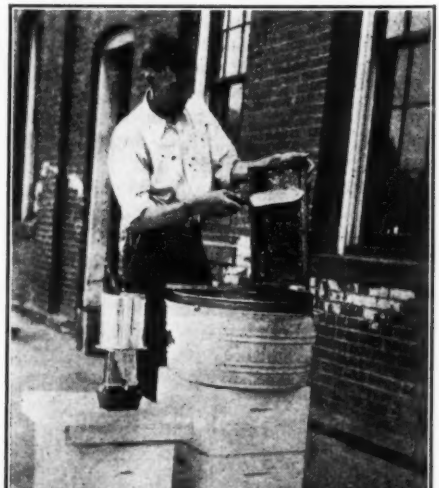
These colonies from which honey was taken in August were wintered in a bee cellar and they did manage to winter through but they were quite weak the following spring. As a matter of fact, it was a little difficult to determine what was the proper thing to do with them. At that time, the spring of 1918, the shipping of package bees was not very common. A few years later quite a volume of packages was shipped from the South to the North.

Each of the weak colonies needed a queenless package of bees to give it a boost. I tried to keep these weak colonies alive by placing them on top of stronger colonies with a screen between, in order that the colonies on top would be benefitted by some of the heat that rose from the strong colonies. The weak colonies above had an entrance. I did manage to save most of the weak colonies but they did not build up into sufficiently populous colonies to store a good crop of honey.

The Model-T Ford Balked

I had been bragging a little about my Ford truck, the way it ran without giving any trouble. The first summer we were there we did not have a flat tire during the entire season. It is a good thing we didn't because the car had old clincher tires.

However, one evening, after we had made a trip to Manistee, the Ford refused to start when I attempted to drive it into the garage. After exhausting my limited source of mechanical ability, I got in touch with a garage man in Copemish. He couldn't get the car started either, so towed it into Copemish and it took him almost a half a day to find the trouble.



This backlot beekeeper can heat water in a 10-pound pail placed over a hot plate or oil stove. The uncapping knife is dipped into hot water before used.

Just News

The summer meeting of the **Illinois Beekeepers' Association** will be held in the City Park, Herrin, Illinois, July 24 and 25. The meeting will begin at 1:00 p.m. on the first day with a banquet scheduled for that evening. Reservations for the banquet must be in before July 15, at a cost of $2.50 per plate. Send remittances to H. E. Dale, Rt. 1, Box 5, Herrin, Illinois. Tickets will be sent by return mail. Contact the Lymar Hotel, Herrin, Illinois for overnight reservations.

The **Ohio Beekeepers' Association** will hold three meetings during July and August. The first is scheduled for July 11 at Bellefontaine, the second at Chillicothe, July 24, with the final meeting of the series scheduled for August 7th at New Philadelphia.

The **North Dakota** and **Minnesota Beekeepers' Associations** will hold their annual joint summer meeting at Detroit Lakes, Minn. on July 23 and 24. A pot luck lunch will be served the first day, and a Minnesota honey queen will be chosen for the first time.

The **Michigan Beekeepers' Association** summer meeting will be held on Friday, July 16 at the Free Fair Grounds in Ionia, Michigan. This is a good central location and we look for a big turn-out. A picnic lunch and supper will be held at the grounds.

Program will be very interesting and will include talks, panel discussion, choosing the honey queen and awarding of honorary life certificates. In the evening the famous Texas Company movie "Bees for Hire" will be shown. Mark the date on your calendar now, we want to see **you** at the meeting.

The **Empire State Honey Producers'** summer picnic will be held Saturday, August 14th, at George Walthousen's picnic grounds on Kelley Road, Schenectady, New York. The **Schenectady County Beekeepers' Association** will be hosts for this affair and they will serve coffee and ice cream. There will be sufficient facilities available to seat more than 300 people inside in case of rain.

Similar to last year, the beekeepers present will choose the "Beekeeper of the Year" and the New York State honey queen. It may be possible to get Chester DuMond, Commissioner of the New York Department of Agriculture, to present a plaque to the New York Beekeeper of the year. Mr. M. J. Deyell, editor of Gleanings, will also participate in the program.

The **Rhode Island, Massachusetts, Connecticut Tri-State Meeting** will be held on July 10 and 11, at the University of Rhode Island, Kingston, R. I.

The **Westchester County Beekeepers' Association** will hold its next meeting Sunday July 11, 2:30 P.M. at the home of Edward Bella, 535 Wynnewood Rd., Pelham Manor, New York (this is off Pelham Rd.). A cordial welcome is extended to those interested in beekeeping. A hive inspection will be made of Brother Bella's apiary to see how good an apiarist he is.—C. E. Slater, Publicity.

The **Seventh Annual Beekeeping Short Course** will be held August 5 and 6 in Lynchburg, Virginia, at the Quality Dairy, 201 Oakley Avenue on Route 460. George H. Rea will be one of the guest speakers on the program. Write to J. M. Amos, Extension Entomologist, VPI, Blacksburg, Virginia, for details.

The **Southern Tier Beekeepers' Association** of New York will hold a summer meeting on Wednesday evening, July 28 at the C. L. Reynolds Radio and Appliance Salesroom, 25-27 Sturges Street, Binghamton, New York.

Mr. M. J. Deyell, Editor of Gleanings, will be the guest speaker of the evening. His topic will be "Producing Section Comb Honey Using the Double Brood Chamber Hive".

Door prizes will be given and a lot of free beekeeping literature will be offered. Refreshments will be served. —H. B. Webb, Secretary.

The **Middlesex County Beekeepers' Association** will hold its third regular outdoor meeting at the summer home of Mr. and Mrs. James Delorey in Groton, Mass., on Saturday, July 31.

In addition to the regular July meeting of the Association, we have received a special invitation from Mr. and Mrs. Cheney to visit them at their summer home in York, Maine, on Saturday, July 10.—L. C. Proctor, Sec.

The **Northwestern Pennsylvania Beekeepers' Association** will meet at Canadohia Lake, July 28th to choose a candidate for Pennsylvania's honey queen. The candidate will later compete with contestants from all over Pennsylvania for the state title. Walter Barth, Associate Editor of Gleanings, will participate in the program. Complete details can be obtained from Ivan Barton, Route 1, Townville, Pa.

Pennsylvania Short Course. Penn State University offers a short course in beekeeping, August 16 to 21, at State College, Pa. The cost of the course is $7.50 for residents of Pennsylvania and $12.50 for those attending from other states. Interested beekeepers should contact A. L. Beam, Dairy Building, State College, Pa.

Milk Weed Disease. In various parts of Michigan milkweed is reported to be afflicted with an unknown disease. So reports E. C. Martin in the **Michigan Beekeeping News.**

"Milkweed is an imporant honey plant with some beekeepers," Martin pointed out, "and I would like to hear from any beekeepers who find diseased plants. A description of the appearance of the disease along with a plant or photograph would be desirable. It is probable that nothing could be done to control disease in a widespread plant like Milkweed, but in any case the nature of the disease should be found out."

Massachusetts Beekeepers: The annual beekeeping program at the University of Massachusetts, Amherst, Mass., will be held Saturday, July 24 starting at 9:30 A.M. Guest speakers will include: E. J. Anderson, of Pennsylvania, State University; Ed. Braun of the Canadian Department of Agriculture, Ottawa, Canada; Milo Bacon, Chief Apiary Inspector of Massachusetts; and Henry Poole, President of the State Federation of Massachusetts Beekeepers.

Beekeeping in Saskatchewan, a 92-page bulletin on beekeeping, is now available from the Apiary Division, Plant Industry Branch, Saskatchewan Department of Agriculture, Regina, Saskatchewan, Canada. This excellent publication was prepared by J. H. Arnott and S. E. Bland, beekeeping specialists for Saskatchewan. The outstanding color photo on the cover shows a honey bee foraging alfalfa for nectar.

Alsike Clover Pollination. The May 1954 issue of **Minnesota Farm and Home Science** published an article by Roland L. Fischer called "Honeybees Aid Production of Alsike Clover Seed". A photograph of a honey bee working on a clover blossom is featured on the cover of this issue. A summary of this material will be brought to the attention of Gleanings' readers in the near future through our monthly column "Bee Facts".

The 1953 Report of the State Apiarist of Iowa is available to all beekeepers upon request. Requests for a copy should be directed to F. B. Paddock, State Apiarist, Ames, Iowa. This new report covers a multitude of subjects that range from control of A.F.B. through labor saving devices for the apiary. Gleanings urges beekeepers to send for this free booklet.

New Bee Publication—"The Use of Antibiotics in Controlling European Foulbrood of Honeybees" by Joseph O. Moffett, a 32-page booklet that brings together all of the information on the subject of E.F.B., has just been released by the Colorado Agricultural Experiment Station. Known as Technical Bulletin 53 (issued April 1954), this publication can be obtained free by writing to the author at Colorado Agricultural Experiment Station, Fort Collins, Colorado.

Honey will be supported in 1954.—According to an undisclosed source in Washington, D. C., the House Agriculture Subcommittee voted to retain without change the present mandatory price law for honey. The Senate committee has followed suit.

The **Mississippi State Beekeepers' Association** will meet July 14 and 15 at State College. A cordial invitation is extended to all beekeepers.

The **Berks County Beekeepers' Association** will hold its annual summer meeting and picnic on Sat. Aug. 7, at 1:30 P.M. at the Ontelaunee Orchards, one-fourth mile south of Leesport, Pa. on the Pottsville Pike. Election of officers will be held.—Henry F. Phillips, Sec.-Treas.

THE SECOND American National Honey Show will be held August 28 through September 6, at the State Fair Grounds, St. Paul, Minnesota, according to C. D. Floyd, secretary of the Show. A new trophy in the amber honey class will be offered by the Finger Lakes Honey Cooperative of Groton, New York.

Ten trophies will be awarded to winning exhibits, and beekeepers from all over the United States are invited to compete. All exhibits must be delivered not later than 5 p.m., August 26, to the Minnesota State Fair Grounds, St. Paul, Minnesota. All transportation charges to and from the fair grounds shall be the liability of the exhibitor. Labels and cartons for reshipping exhibits by general carrier must be supplied with the exhibit.

Each article to be placed on exhibition shall have all identification marks on the underside of the jar, and all numbers shall be either on tape or clearly marked with a waxed pencil. Each exhibit must be the property of the exhibitor. The judges shall be empowered to withold prizes in cases of insufficient merit or if the exhibit is unworthy of the Show.

Dr. Mykola H. Haydak of the University of Minnesota and E. C. Martin of Michigan State College will be the judges of this show. A program of the show that gives the rules and regulations governing all exhibits can be obtained at no cost from C. D. Floyd, University Farm, St. Paul 1, Minn.

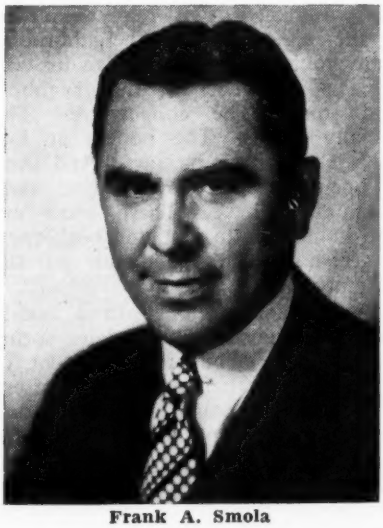
ATTENTION: Beekeeper Association Presidents and Secretaries

It is now time to start getting ready for the October Honey Promotion which culminates in National Honey Week. In order to expedite the work of the Marketing Committee of the Federation, it is necessary to know the names of the various State Marketing Committee Chairmen.

Please send their names to Mr. Frank A. Smola, Executive Director, The American Beekeeping Federation, 82 West Washington Street, Chicago 2, Illinois, or to me.

The USDA is quite willing to help us develop a sound, self-help program, but they "insist" that the initiative and major planning is up to the honey industry. All-out aid will be given by them only in case of a serious crop surplus followed by obvious marketing difficulties.

It is up to US to consolidate our plans and perfect our program. Much progress has been made during the past two years, but we must pull together and all do their share to make the campaign a success. Let us have YOUR HELP.—S. Joaquin Watkins, Chairman Marketing Committee, Fruita, Colorado.



Frank A. Smola

American Honey Institute News Notes

by HARRIETT M. GRACE, Director
Commercial State Bank Building, Madison 3, Wisconsin

SPRING housecleaning may be over for the homemaker, but it is just beginning for the honey salesman. No, we don't mean the basic task of straightening up your honey equipment and putting all in order for another season; that you do without question or without pause.

But have you thought of spring housecleaning your **methods** of selling honey?

Therein lies the crux of a success or failure this year. If you are never satisfied with the showing of the year before, be it fair, good, or excellent, but yearn for something better in 1954, it is a good bet that you will get that "something better".

Be happy with the status quo and you will get stalemated at that point. Be dissatisfied and that dissatisfaction will breed an effort to rejuvenate your business.

We like to call it "spring housecleaning" your business operations. Take the broom of self-examination and sweep out the cobwebs that hang around an undisturbed room — or business.

Do you really reach all avenues of honey marketing in your locality? You want to grow. Every businessman does. But have you really explored all the areas in your neighborhood where your honey might edge its way in? The supermarkets, the neighborhood store. The cooperative. The specialty stores. The booths at fair time. The church bazaars. And even the open "green" markets that many communities have. These spots are open invitations to you, the beekeeper, to get honey in the hands of the consumer.

If you market honey in a booth, have you shined it up for its spring debut? How about a fresh coat of paint, a new banner sign, a fresh planting of perennials around the outside? How about the signs on the roadside leading up to the booth—do they give the driver of a fast-moving car enough time to decide he would like to try your honey and slow down to make your turn-in? Have you mowed the lawn, and made your booth as clean and fresh looking as you want folks to think your honey is?

First impressions are paramount in selling from a booth, for it is the **only** impression. It takes only a few seconds for a driver of a car to decide yes or no and move on to other scenery.

Has your business kept pace with the rest of the industry? That is a loaded question. It takes a brave man to answer it truthfully. For sometimes we would like to **think** we are keeping abreast of the times, when deep down within we know we could be doing better.

THE TIMES demand that we advertise both on a national and local level. Nationally the AHI takes care of our needs; locally we must fend for ourselves.

The times demand that we unify as an industry, that our local, state, and national organizations receive full support from producers. Institute membership is up higher than it has ever been, a most heart-warming sign of beekeeper interest in progress.

The times demand that we market wisely and keep up with the homemakers' demands for fresh, ready-to-eat, cheap products. Have you pointed out to her how well honey fits this bill of particulars?

The times demand much more of an all-out effort to produce and market a food in a tighter economy. Are you making that effort?

Has your honey label the same appeal you thought it had when you chose it years ago, now that you must compare it with the newer models on other packages? One look at the trend toward clear colors, uncluttered printing, multi-colored and informative labels must give you a chill now and then. It is hard to change label formats, yet if your honey is not competing favorably with its brighter more sparkling competitors, then change you must.

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 15c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceeding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 2.

Michigan's finest raspberry, basswood, clover comb honey, in 4 x 5 window cartoned sections. Extra Fancy, $8.00; Fancy, $7.00; No. 1, $6.00; No. 2, $5.00 case. E. Z. Quick Way B Farms, Boyne Falls, Mich.

NORTHERN NEW YORK'S finest white clover comb honey. Forrest Dygert, Hammond, N. Y.

CLOVER COMB HONEY FOR SALE—Write for prices. C. W. Schrader, Waterville, N. Y.

HONEY FOR SALE—Orange, sage, clover, sage-buckwheat; all types of bakery honey and mixed flowers. Wholesale only. One can or a carload. American Honey Company, Colton, Calif.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for your comb honey and all types extracted. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH for Beeswax. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED for cash. All grades. Good used cans for sale or trade for honey. John Tideswell, 2711 North 63 St., Omaha, Nebraska.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Co., Millersport, Ohio.

HONEY WANTED, all grades in 60's. Mail samples advise quantity, best price. A. I. Root Company of Syracuse, 1112-14 E. Erie Blvd., Syracuse, N. Y.

CASH FOR YOUR HONEY—Light extracted or comb. Regular trade send sample. 60-pound cans furnished if desired. W. R. Moomaw, Stone Creek, Ohio.

WANTED — Honey, all grades. Quote prices and send sample. Write Stoller Honey Farms, Latty, Ohio.

WANTED—Light amber-clover and fall-flowers honey. Cloverdale Honey Co., Fredonia, N. Y.

WANTED—100 cases No. 1 comb honey. Lloyd E. Allen, Tipton, Michigan.

BEST CASH DEAL for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—white and amber extracted honey, car loads or less. Write, stating best price. Honeymoon Products Co., 39 E. Henry St., River Rouge, Mich.

FOR SALE

WRITE FOR CATALOG — Quality Bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. K.D., 10 or more, $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid, $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries. Waban, Massachusetts.

ELECTRO Filling Machines, users and distributors. Write Stoller Honey Farms, Latty, Ohio.

NOW AVAILABLE, Fumigil for control of Nosema disease in bees. Write for prices and circular by Abbott's Laboratories. PRAIRIE VIEW HONEY CO., 12303 12th Street, Detroit 6, Michigan.

AT COST—4M 2½-lb. new Continental tin cans; 2½-lb. square glass jars; 2½-lb. can single shipping carton. Also beekeepers' supplies. Roscoe F. Wixson, Dundee, New York.

FOR SALE—New hand power 4-frame honey extractor, never used, $21.00. Willis Steele, 118 13th st., N. E., Faribault, Minn.

NEW Root 20-frame extractor, $175.00; 10-frame hive bodies, supers, covers, bottoms, and excluders. C. Strahan, 207 N. 2nd St., Missouri Valley, Iowa.

HONEY LABELS

Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.

C. W. AEPPLER COMPANY

Oconomowoc, Wisconsin

INDIANA BEEKEEPERS

Be sure to get our 1954 Bee Supply Catalog, which will soon be ready.

We have the finest Package Bees and Queens. Order now. Open every day except Sundays and Holidays.

A. I. Root Co. of Indianapolis
121 No. Alabama Street
Indianapolis 4, Indiana

HONEY CONTAINERS

Tin

Glass

Paper

Write for price list.

A. H. Rusch & Son Co.

Reedsville, Wis.

STOLLER'S

Frame Spacers

The finest thing ever offered beekeepers. See your dealer, or write

STOLLER HONEY FARMS

Latty, Ohio

If you are taking time to read, why not read the best? Condensed to save you time. Illustrated to give you pleasure.

Modern Beekeeping

The Picture Bee Magazine

Box 210 Clarkson, Kentucky

ROSEDALE UNCAPPING PLANES; NOW DUTY FREE—Speedy uncapping—easy to handle—adjustable depth of cut. Satisfactory performance fully guaranteed for one year. Rosedale Co., 509 Rupertsland Ave., Winnipeg, Canada.

IF YOU CAN'T LIFT those heavy supers let Kruse's Super Lifter and transport truck do it for you. Easily handles 150 pounds or more. Low in price too. Money-back guarantee. Why not give it a trial. Write for illustration and prices. Frode A. Kruse, Rt. 1, Luck, Wisc.

FOR SALE—1952 Bogenschutz uncapper stainless steel, $1200.00. Charles De Mesy, Breckenridge, Minn.

FOR SALE — New Electro-Flo Model S.A. 200 Filler for containers from 5 lbs. to 60 lbs. Never used. Cash $285.00. Sell for $150.00. Charles De Mesy, Breckenridge, Minn.

FOR SALE—One 20-frame Simplicity extractor with one ¼ h.p. motor; one 2-frame reversible extractor; three steam knives; 1 electric knife; 2 hot water knives; 4 40-gal. tanks; 1 20-gal. tank; 1 metal strainer; 48 comb honey supers with fixtures. 20% of cost. Stevens Apiaries, Oberlin, Ohio.

FOR SALE: 28 x 56 honey house in open territory, 2-ton bee truck, 300 hive bodies with frames. Tops, bottoms, extracting and processing equipment, lift truck, and numerous other beekeeping articles. Can be seen on week ends. Prices right. R. L. Griggs, Hancock, Iowa.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

CAUCASIANS. 2-lb. pkg., $3.00; 3-lb. pkg., $4.00. Untested queens, $1.00 each; 100, $75.00. Lewis & Tillery Bee Co., Greenville, Ala.

TWENTY-ONE YEARS OF BREEDING. Jersey queens for bumper crops. $1.00 each. Milton Stricker, R.D. 1, Annandale, N. J.

THREE-BANDED ITALIAN bees and queens. Extra good workers and very gentle. 2-lb. with queen, $3.00; 3-lb. with queen, $4.00. Untested queens, 1 to 25, $1.00; 25 to 50, 90 cents; 50 up, 80 cents. Add 25 cents for the Starline Hybrids. Alamance Bee Co., Graham, N. C.

GOLDEN ITALIAN bees and queens. Very gentle and real yellow. 2-lb. with queen, $3.00; 3-lb. with queen, $4.00. Select-untested queens, 1 to 25, $1.00; 25 to 50, 90 cents; 50 up, 80 cents each. Carolina Bee Farm, Graham, N. C.

YELLOW ITALIAN BEES. Real producers. Health certificate. Satisfaction guaranteed. 2-lbs. with queen, $3.50; 3-lbs., $4.50; queens, $1.00; 20 to 49, 90c; 50 up, 85c; Airmail postpaid. O. E. Brown, Rt. 1, Asheboro, N. C.

CAUCASIAN bees and queens. Very gentle and good workers. 2-lb. with queen, $3.00; 3-lb. with queen, $4.00; select-untested queens, 1 to 25, $1.00; 25 to 50, 90 cents; 50 up, 80 cents each. Black River Apiaries, Currie, N. C.

NORTHERN ITALIAN QUEENS — for production, $1.00 each; 10 up, 90c. Shirl Baker, Rodney, Michigan.

FOR SALE—27 colonies of bees free from disease, very strong, hives and supers. Eight-room house, garage, barn, four-room bungalow. All or part for sale. Poor health cause of sale. Will finance. R. B. Hibbard, Calcium, N. Y.

FOR SALE—Seven apiaries, 265 colonies 10-frame with extracting supers and winter packing cases, good condition, ready to produce. Located near Savona, N. Y. Roger C. Lane, Trumansburg, N. Y.

FOR SALE — Any or all, 100 strong healthy colonies Italian bees in good standard 10-frame hives and supers. Karl Rude, Mexico, New York.

SEEDS

HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

Bargains in new or used honey cans or Root Supplies for cash or honey. Buckeye Honey Company, 3930 N. High St., Columbus 14, Ohio.

HAVE FOR SALE and WANT TO BUY used extractors of all kinds. John Layman, 702 West 6th Street, Bloomington, Indiana.

MAGAZINES

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarh Dist. Naini Tal, U. P. India. or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs 1/8/, or s 2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

ARCHIVE OF BEE SCIENCE (Archive fur Bienenkunde), oldest scientific, independent bee journal in the world. Select feature material gives lasting theoretical and practical knowledge. Sample copies available. Two large 1953 editions for the low price of DM 5.50. Biene-Verlag (Bee Publishers), Lindau (B), Postcheck Karlsruhe 5581, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With **Apicultural Abstracts** it costs $3.00 per annum. **Apicultural Abstracts** only $1.75 per annum, from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

DO YOU FIND it difficult to secure information about sheep and sheep ranching methods? The SHEEP AND GOAT RAISER reaches more sheepmen with more information on range sheep than any other magazine published. Subscription $1.00. Hotel Cactus, San Angelo, Texas.

U. S. Savings Bonds come in all sizes . . . . .and grow bigger every year.

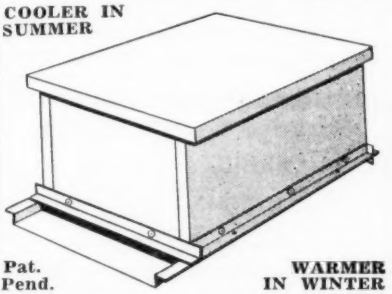
Cash Paid for extracted honey in 60-lb. cans in all grades.

Mail samples and prices.

C. W. AEPPLER COMPANY

Drawer 239 Oconomowoc, Wisconsin

COOLER IN SUMMER



Pat. Pend.

WARMER IN WINTER

UNI-TEMP ALUMINUM HIVE

Dealer Inquiries Invited.

The A. H. HALE CO.

Hapeville, Georgia, U.S.A.

— HONEY WANTED —

ALL GRADES. SEND SAMPLES

ADVISE QUANTITY

HONEY SALES COMPANY

1806-08 No. Washington Ave., Minneapolis 11, Minnesota

BRITISH BEE JOURNAL

The Only WEEKLY BEE Journal in the World

Subscription $4.50 per annum payable in advance.

Keep up to Date in Beekeeping by taking out a subscription now through our agents:

Gleanings in Bee Culture

Medina, Ohio

CAUCASIANS
CARNIOLANS

Will meet every need of the beekeeper. Both races have longest tongues, build up rapidly in spring, make white combs, and are gentlest of all races of bees. Queens $1.00 each, air mail. Ready June 15 in Tennessee. Send all orders here.

W. D. REAMS
Lowland Apiaries
Morristown R. 5 Tenn.

QUEENS

Italians of the George W. Moore strain, personally raised and purely mated for the remainder of the summer, at 60 cents each.

HANSON HALL BEE CO.
Livingston, Ala.

Package Bees & Queens
Quality & Service
C. F. KOEHNEN & SONS
Glenn, California

Booking orders now. Over 30 years a shipper. Send for Free Circulars.

BLUE BONNET APIARIES
Weslaco, Texas

GIRARDEAU APIARIES
Tifton, Georgia
Shippers of
ITALIAN
Package Bees and Queens

FLOWERS' QUALITY QUEENS
Breed from hives that made 300 pounds of honey, gentle and prolific. All queens mated and laying guaranteed. Prompt shipment.
1 to 1000, prepaid airmail, 50c each
FLOWERS BEE COMPANY
JESUP, GEORGIA

ACID METHOD OF TAKING OFF HONEY

(Continued from page 406)

cloudy conditions. Some go to the point of using blow torches to warm up the pads, but I've never found this to be much of an advantage. It must be remembered, in cool weather, it isn't so much that the acid pads work slower, but that the bees are stiff with cold and move more slowly. If one is to use a blow torch, it would be more important to warm up the bees than to warm up the pads. What we do is to put the pads on and then blow smoke under them. If the bees are stiff and cold, one must just wait a little longer to give them a chance to move out. When we lift up a super and still find bees in it, we just stand it up on end, blow smoke through it, and brush the bees out with a bunch of grass or a bee brush.

That, briefly, is our system and no doubt it can be improved upon in a hundred ways. However, with these basic ideas and a little practice one should not find it too difficult to take off about 50 supers an hour. That is about as fast as two men can take it off and load them into a truck. It must be realized that anyone doing it for the first time will be awkward and slow. With practice one will soon develop a system best adapted to his conditions and make the job of taking off supers a simple and fast procedure.

Carbolic Pad for Queen Introduction

Almost any queenless colony can be successfully requeened with it and the process is simple. Just drive the bees out of the hive with the carbolic pad, and plug the entrance loosely with green grass. Every bee doesn't have to be driven out, but just a major portion. Then put into the hive a few frames of bees and brood taken from another hive and put the carbolic pad on for another minute or two. Then immediately put on the inner cover, and release the queen quickly from the cage and run her into the hive either at the entrance or through the opening in the inner cover. Cover up the hive and next time you come back, chances are the queen will be laying.

The pad, of course, has other uses like driving the bees out of the hive

for various reasons or through excluders to find the queens. Perhaps some experts on this subject can add to what I have said here and if so, no doubt the editors of Gleanings will be glad to hear from them. I, for one, have plenty of room for improvement, and would like to see any improvements others have made to help take off supers quicker, easier, and better.

[Note: If you have a cross colony try putting a little carbolic acid on top of the smoker fuel. This will take the fight out of bees.—Ed.]

●

EQUIPMENT FOR PROCESSING HONEY

(Continued from page 414)

by this Division for the commercial honey packer.

The honey from a covered extractor will flow into a double-jacketed, covered, heated sump, equipped with coarse metal strainers, then pumped through pressure controlled in-line strainers of a very fine mesh, to a storage tank for filling into drums.

If a processing unit is installed in the honey house, the honey from the storage tank will be pumped through the pasteurizing and cooling units, then bottled as liquid honey or have seed injected into the line and proceed through the filling machine into the containers for storage or sale.

Acknowledgment

The author wishes to acknowledge the kindly advice and assistance so generously given by Dr. C. A. Jamieson, Chief, and Mr. G. H. Austin, of the Apiculture Division; the assistance rendered by Mr. Gordon Caven, Sales Engineer for the Walker-Wallace Co. Ltd., Toronto, on the plate-type heat exchanger; the splendid cooperation and assistance received from Mr. W. Kalbfleisch and Mr. J. W. White, Agricultural Engineering Section, on the construction and operation of the tubular-type heat exchanger; Mr. Gudheim, and Mr. C. Rassmussen, of the Rodney Hunt Machine Company, Orange, Mass., U.S.A., for their experimental trials with the continuous vacuum-type heat exchanger, and to the various staff and student members who assisted with the operating trials of the varied types of equipment.

Thank You —

for the nice business given us this year. We will be in business supplying you queens the remainder of this season and Package Bee and Queens in the years to come.

It has been a great pleasure serving you both on time and short notice.

Bees cannot be prepared and put on storage for future delivery so we do the better thing. Prepare and make shipment the day promised or as near the requested date as possible on orders for immediate shipment.

	4-Way Island Hybrid	Rossman Stock Queens
1-25	$1.15 ea.	90c ea.
26-99	1.05 ea.	80c ea.
100 or more	1.00 ea.	75c ea.

"They Produce"

Rossman Apiaries

P. O. Box 133 Moultrie, Ga.

QUALITY BRED ITALIAN QUEENS

March 10 to June 1 $1.00 each

June 1 to Nov. 1 .50 each

All queens shipped Air Mail and guaranteed to please.

Walter D. Leverette Apiaries

Fort Pierce, Box 364, Florida

Renee Brand Queens

1-25 ..... .95 26-up ..... .85

Live delivery guaranteed

Prompt shipment
Queens Air Mailed,
Clipped on request

SILVER HIVES APIARIES
Enterprise, Florida
We do our best to satisfy.

T W I S T
Bee Supers No. 1
Grade Supers No. 2
Write for Prices.
S. E. TWIST
201 Alpha St., San Francisco 24, Cal.

STARLINE SUNKIST ITALIANS

You can pay more but will not get better quality. We offer two outstanding queens: Dadant Starline and Sunkist Italians.

	Italian Q.	Starline Q.	
1 -24	75c	$1.25	All queens clipped,
25 -99	70c	1.20	airmailed. Marked
100-up	65c	1.10	on request.

Reg. U.S. Pat. Off.

SUNKIST BEE CO. CONVENT, LA.

JENSEN says:

Requeening any time old queens are found failing to maintain optimum colonies, with all the potentials necessary for producing the maximum colony population, is good constructive practice.

Good queens are the greatest factor in the success of your entire operation. Price considered, they are your best investment, and the one item contributing most toward the value of, and profit from everything else invested in your business including labor, whether your own or hired.

Jensens offer you the choice of two fine lines.

"Magnolia State" Italians	Magnolias	Dadant "Starline" 4-way Hybrids	Starlines
1-24	$1.10		$1.35
25-99	1.05		1.30
100-up	1.00		1.25

Reg. U.S. Pat. Off.

Clipped and Marked Free. Air Mail. Post-paid.

JENSEN'S APIARIES Macon, Miss. U.S.A.

ITALIAN ..... "GULF BREEZE" ..... QUEENS

The time to requeen is when poor queens are found. Replace with good **"GULF BREEZE"** stock and not with another poor queen.

Prices: 1-24, 80c each 25 up, 75c each; postpaid air mail.

BESSONET BEE COMPANY Donaldsonville, La.

BRIGHT THREE-BANDED ITALIAN QUEENS

Our Strain is from early imported Italians. Their behavior is more according to pattern than most other races. They are usually gentle, hardy, good workers, and not inclined to swarm. Use our queens and you will be in line for all the honey crops and have nice bees to work with.

PRICES, balance of season:

1 to 50 ..... 80c each
50 or more ..... 75c each

TAYLOR APIARIES
Box 249 Luverne, Ala.

The New Zealand Beekeeper

The Quarterly Magazine of the National Beekeepers' Association of New Zealand. Better Beekeeping — Better Marketing. Subscription, 8 shillings per year, payable to

THE GENERAL SECRETARY
Box 19 Foxton, New Zealand

HARPER'S FAMOUS

High Quality Italian Queens Sent Air Mail

75c each; 10 or more, 65c each

CARLUS T. HARPER
New Brockton, Ala.

SULLIVAN'S ITALIANS
Effective May 15 These Prices:

2-lb. pkg. with queen .....$2.25 each
3-lb. pkg. with queen ..... 3.00 each
Queens ..... .65 each

Live delivery and satisfaction guaranteed.

SULLIVAN'S APIARIES
Gilbertown Ala.

OLDEST BEE JOURNAL IN THE ENGLISH LANGUAGE

Keep up on markets, practices, scientific data, regulations and plant possibilities.

1 year, $2.00, U. S. and Canada
Foreign postage, 50c a year extra

AMERICAN BEE JOURNAL
Hamilton, Illinois

Good Queens and Package Bees. Young Three-Banded Italians only. Tops in production and gentleness. The choice of leading beekeepers for more than thirty years. Prompt shipment. New cages. More than full weight. No disease.

Queens ..... **.85 .80 .75**

Queens shipped regular or air mail postpaid. Large orders of package bees, express charges collect. Small orders by parcel post. Postage added to prices quoted. Please order in advance if possible.

H. C. SHORT **Fitzpatrick, Ala.**

BETTER BRED QUEENS **THREE-BANDED ITALIANS**

65c ea. **Air mail**

Use them for replacing failing queens, also requeening for swarm control, etc. You can't buy any better queens at any price.

65c ea. **Air mail**

CALVERT APIARIES **Calvert, Alabama**

QUEENS — TOP QUALITY

DO NOT PUT OFF replacing those WORN-OUT queens. A change WILL Pay Off . . . . . with GARON'S THREE-BANDED ITALIANS — or, with DADANT'S STARLINE 4-WAY HYBRIDS. NONE BETTER.

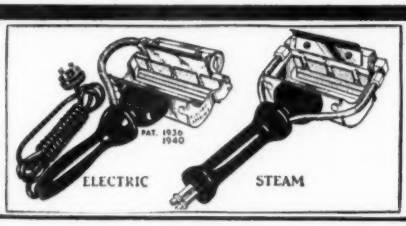
	GARON'S THREE BANDED ITALIANS	DADANT'S 4-WAY STARLINE HYBRIDS
1-24	85c	$1.25
25-99	80c	1.20
100-up	75c	1.10

DADANT'S STARLINE HYBRIDS

Reg. U. S. Pat. Off.

Queens clipped and/or marked, also Air Mailed upon request at no extra cost.

GARON BEE COMPANY **Donaldsonville, La.**



We are again able to offer the improved Rosedale Steam and Electric Uncapping Planes to the American beekeepers. Price delivered, Electric Plane $13.00. Steam Plane $8.00. Satisfaction guaranteed. Full line of repairs on hand.

JOHN J. MAENDEL
Forest River Colony
Fordville, N. Dakota

"Wise-Woodmanize with your Bee Supplies"

A. G. Woodman Co. (Send for Catalog - 350 Listings) Grand Rapids 4, Mich.

SUMMER PRICES

First Quality Italian Bees and Queens

Prices for rest of season:

2-lb. packages with queens	**$2.00**	**any number**
3-lb. packages with queens	**2.50**	**any number**
4-lb. packages with queens	**3.00**	**any number**
Untested queens	**.50**	**any number**
Tested queens	**1.00**	**any number**

Bees F.O.B. Queens mailed and clipped on request. All Merrill's bees and queens are backed with our 100% satisfaction.

MERRILL BEE COMPANY

Box 115 State Line, Miss.

QUEENS QUEENS QUEENS

"ITALIANS"

We offer you young laying queens, shipped prepaid, airmail. Mark colonies with old and failing queens and replace when conditions are favorable. Queens available until November 1st. Clipped and painted at no extra cost.

1-9	.75 ea.
10-up	.70 ea.
Tested Queens	$1.50 ea.

Quality Does Not Cost — It Pays

THE WILBANKS APIARIES CLAXTON, GEORGIA

QUEENS

Italian or Caucasian

Health certificate and live arrival guaranteed with each shipment. Send your requirement now.

— Price —

1-24	75c
25-50	65c
100 up	60c

FARRIS HOMAN

Shannon, Miss.

ITALIAN

Package Bees and Queens

Jackson Apiaries

Box 58 Funston, Ga.

Queens Queens

ITALIAN

Nice large queens 55c each

Mitchell's Apiaries

Bunkie, La.

Italian Queens

EUGENE WALKER

Rt. 2, Box 207

Live Oak, California

SIMPLIFIED WEIGHT CONTROL

(Continued from page 422)

an out apiary and see it only on weekends. In 1952 seven of the eight weekends during April and May were cold and rainy, and we could not do the inspection and manipulating indicated as necessary by the tables. We had more swarms that year than in all our previous years put together.

In addition to the two tables referred to above, we plot a curve for each hive which shows its status and progress graphically. We also keep a graph for the average of the apiary and one for the average weekly gain or loss.

To us the latter graph, shown on page 421 is the most interesting. It indicates when the honey flow occurs in our locality (near Morristown, New Jersey) and how it varies from year to year. During the last two years we have added to the graph the names of the flowers the bees are working at the time. This makes the graph still more interesting.

York's Quality Bred Queens

Two Strains

Queens Bred Up to a Quality—Not Down to a Price

York's Italians		Dadant's Starlines	
1-24	$1.00	1-24	$1.40
25-99	.85	25-99	1.30
100-up	.75	100-up	1.20

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The Preference of Leading Honey Producers

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(The Universal Apiaries)

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Packages With Young Laying Queen
At the Following Prices:

	1-9	10-99	100-up
2 lb.	$3.75	$3.50	$3.25
3 lb.	4.75	4.50	4.25
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We guarantee safe arrival, a health certificate with each shipment, and prompt service.
Our Queens are reared under my own personal supervision, our aim is QUALITY NOT QUANTITY

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By Return Mail 50c

BRIGHT 3-BANDED ITALIANS

33 years as shippers

— PRICES —

2-lb. pkg. with queen	$2.50
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QUEENS	QUEENS
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QUEENS, are reared in the mountains of the North, from stock full if vim, vigor, and vitality. Queens reared by the veteran queen breeder, J. B. Hollopeter with 44 years experience.

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Rockton, Pa.

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Italian Package Bees and Queens
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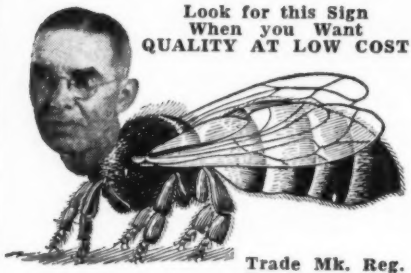

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When you Want
QUALITY AT LOW COST

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KELLEY — "The Bee Man"

QUEENS

KELLEY ISLAND queens by the thousand are available now. If you are in a rush count on us for quick shipment by return air mail.

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